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Art. I.—*The Two Books of Francis Lord Verulam. Of the Proficience and Advancement of Learning, Divine and Human.* London. Pickering. 1825. 8vo. pp. 402.

[Continued from page 242.]

In our previous notice of this work, we have made liberal extracts from the author. We do not allude to the fact for the purpose of apologising for the course we have taken in this respect; for we are well satisfied that those who take interest enough in our views to follow us in our speculations, will be pleased to see these quotations. They contain much evidence of the peculiar character of Bacon's understanding; and with what we shall now give, will afford abundant proof of his deep and thorough knowledge of the powers and capacities of the human mind. Indeed, his writings are much more remarkable for this quality, which seems to pervade almost every page, than for the views they contain of natural philosophy. We express our strong conviction when we say, that Reid, and Stewart, and Brown, though they have built up what is called a philosophy of mind upon induction, have yet but skimmed the surface of the profoundness of Bacon's views. It was from a knowledge of the powers of the human mind, that he deduced the true laws of philosophizing. The vast discoveries to which these laws have led in natural science, have again in their turn enlarged and enriched the philosophy of mind. By the philosophy of mind, we mean the general state of the science of metaphysics, as it is understood in the learned world. In say-

ing that Bacon was far in advance of the writers of the present age in his knowledge of the human mind, we are well aware that we are saying what many will be unwilling to admit. But we think that a little more examination would satisfy them of the truth of this assertion. We have said that the modern discoveries in natural science have improved the general state of the science of metaphysics. Indeed, we regard natural science as the true ultimate and foundation of metaphysics. And as the accurate knowledge which is now possessed, of the laws of nature, was not disclosed to Bacon, his views of mental philosophy must have wanted the strength and precision, which an enlightened consciousness of this foundation alone can give. But without this aid, they were far more deep and penetrating than those of many who regard the science of metaphysics as altogether built up since his day. There are states in which the mind, as it were by inspiration, catches a glimpse of what it is afterwards to receive, and rationally and systematically to comprehend. Bacon stands with respect to the present state of science, in a relation somewhat analogous to that of this state of foretaste or conception, to the state of full possession. How bright and clear his anticipations were, few can realize. But that he was enabled to make them from his knowledge of mental philosophy, is not mere matter of conjecture. There was no other ground upon which he could stand and survey the pretensions of science, and pronounce upon their deficiencies. There was no other ground upon which he could stand, and point out as upon a map, the subjects of legitimate examination and the process of inquiry. We do not mean to say that he was infallible and free from error. He fell into many errors which his knowledge of natural philosophy could not correct. But there are only few men who would thus have erred; for there are but few who possess his power of sustaining a flight into the region of causes and activities. But this was the atmosphere in which Bacon lived and breathed.

We are well aware that there are those who call themselves philosophers, Baconian philosophers too, who are conversant, and profess to be conversant only with effects. But this is a most grievous abuse of names. Though Bacon taught us to observe effects, and to make experiments with a view of establishing theories, and thus apparently to reason from effects to causes, yet this process with him was not the end; but having gained this vantage-ground, he would again descend from causes to effects with the light and certainty of living

experience. Thus he observes, that 'all true and fruitful natural philosophy hath a double scale or ladder, ascendant and descendant; ascending from experiments to the invention of causes, and descending from causes to the invention of new experiments.' In another place he says, that 'a faculty of wise interrogating is half a knowledge;' and adopts the sentiment of Plato, that 'whosoever seeketh, knoweth that which he seeketh for, in a general notion; else how shall he know it when he hath found it?' Now this we take to be strictly true of all discoveries that are made in a philosophical manner. Many discoveries have been made in nature, which were hit upon apparently by the merest accident. But they also appeared at first as anomalous facts, at variance with the uniform laws of nature. And they could never take their place and rank, as matters of science, till they had been viewed from what Bacon calls the 'descendant scale or ladder of natural philosophy.' Before this they would necessarily appear to be contradictory to previously established theories. Hence the necessity of ascending into the region of causes in order truly to understand any discovery, or to reduce facts to a rational theory. Hence, too, the propriety of denominating this view of the ultimate facts and experiments, which is taken from this higher ground, *the discovery*. For a man cannot with propriety be said to have discovered new truths, while these new truths cannot be viewed by him in harmony with all those other principles which he had previously received and which he still regards as truths. Or, if his former principles were false, and thus irreconcileable with the new, he cannot be said to have made the discovery, till the false have been discarded and in this manner harmony has been restored. Thus in all cases, in order to the true discovery of new principles and their reduction to a science, it is necessary that the man should be elevated above the common level of the mere discovery or witnessing of the outward, natural experiment.

'Another error which doth succeed that which we last mentioned, is, that after the distribution of particular arts and sciences, men have abandoned universality, or "philosophia prima" (the chief philosophy); which cannot but cease and stop all progression. For no perfect discovery can be made upon a flat or level: neither is it possible to discover the more remote and deeper parts of science, if you stand but upon the level of the same science, and ascend not to a higher science.'

pp. 55, 56.

We are now approaching the consideration of Bacon's peculiar qualifications for philosophizing. It was 'universality' or 'philosophia prima,' in which Bacon excelled. Nay, it is this in which he now excels; for the great mass of those who regard themselves as his followers, are now standing upon the 'flat or level' upon which no discoveries can be made. We are aware that it is somewhat difficult to understand precisely what Bacon meant by 'universality,' to the abandonment and neglect of which, he imputed in so great a degree the deficiencies of art and science. But he did not use the word as a mere empty sound; and further extracts will doubtless aid the reader in coming to a true conception of his meaning.

'The part of Human Philosophy which is Rational, is of all knowledges, to the most wits, the least delightful, and seemeth but a net of subtilty and spinosity. For as it was truly said, that knowledge is "pabulum animi" (the food of the mind); so in the nature of men's appetite to this food, most men are of the taste and stomach of the Israelites in the desert, that would fain have returned "ad ollas carnium' (to the flesh pots), and were weary of manna; which, though it were celestial, yet seemed less nutritive and comfortable. So generally men taste well knowledges that are drenched in flesh and blood, civil history, morality, policy, about the which men's affections, praises, fortunes, do turn and are conversant; but this same "lumen siccum" (dry light) doth parch and offend most men's watery and soft natures. But, to speak truly of things as they are in worth, rational knowledges are the keys of all other arts; for as Aristotle saith aptly and elegantly, "That the hand is the instrument of instruments, and the mind is the form of forms;" so these be truly said to be the art of arts: neither do they only direct, but likewise confirm and strengthen; even as the habit of shooting doth not only enable to shoot a nearer shoot, but also to draw a stronger bow.

'The arts intellectual are four in number; divided according to the ends whereunto they are referred: for man's labor is to invent that which is sought or propounded; or to judge that which is invented; or to retain that which is judged; or to deliver over that which is retained. So as the arts must be four; art of inquiry or invention; art of examination or judgment; art of custody or memory; and art of elocution or tradition.

'Invention is of two kinds, much differing; the one, of arts and sciences; and the other, of speech and arguments. The former of these I do report deficient; which seemeth to me to be such a deficience as if, in the making of an inventory touch-

ing the state of a defunct, it should be set down, that there is no ready money. For as money will fetch all other commodities, so this knowledge is that which should purchase all the rest. And like as the West-Indies had never been discovered, if the use of the mariner's needle had not been first discovered, though the one be vast regions, and the other a small motion; so it cannot be found strange if sciences be no farther discovered, if the art itself of invention and discovery hath been passed over.

'That this part of knowledge is wanting, to my judgment standeth plainly confessed: for first, logic doth not pretend to invent sciences, or the axioms of sciences, but passeth it over with a "cuique in sua arte credendum" (every man is to be trusted in his own art). And Celsus acknowledgeth it gravely, speaking of the empirical and dogmatical sects of physicians, "That medicines and cures were first found out, and then after the reasons and causes were discoursed; and not the causes first found out, and by light from them the medicines and cures discovered." And Plato, in his Theætetus, noteth well, "That particulars are infinite, and the higher generalities give no sufficient direction; and that the pith of all sciences, which make the artsman differ from the inexpert, is in the middle propositions, which in every particular knowledge are taken from tradition and experience." And therefore we see, that they which discourse of the inventions and originals of things, refer them rather to chance than to art, and rather to beasts, birds, fishes, serpents, than to men.

"Dictamnum genetrix Cretæa carpit ab Ida,
Puberibus caulem foliis et flore comantem
Purpureo: non illa feris incognita capris
Germina, cum tergo volucres hæsere sagittæ:"
(A branch of sov'reign dittany she bore,
From Ida gather'd on the Cretan shore.
Luxuriant leaves the taper stalk array;
The stalk in flow'rs the flow'rs in purple gay.
The goats when pierc'd at distance by the dart,
Apply the med'cine to the wounded part).

So that it was no marvel, the manner of antiquity being to consecrate inventors, that the Ægyptians had so few human idols in their temples, but almost all brute.

"Omnigenumque Deum monstra, et la trator Anubis,
Contra Neptunam, et Venerem, contraque Minervam, &c."
(Against great Neptune, in his strength array'd
And beauteous Venus, and the blue-ey'd maid,
Engage the dog Anubis, on the floods,
And the lewd herd of Ægypt's monster gods).

And if you like better the tradition of the Grecians, and ascribe

the first inventions to men, yet you will rather believe that Prometheus first struck the flints, and marvelled at the spark, than that when he first struck the flints he expected the spark: and therefore we see the West-Indian Prometheus had no intelligence with the European, because of the rareness with them of flint, that gave the first occasion. So as it should seem, that hitherto men are rather beholden to a wild goat for surgery, or to a nightingale for music, or to the ibis for some part of physic, or to the pot-lid that flew open, for artillery, or generally to chance, or anything else, than to logic, for the invention of arts and sciences. Neither is the form of invention which Virgil describeth much other:

"Ut varias usus meditando extunderet artes
Paulatim:"
(That studious want might useful arts contrive).

For if you observe the words well, it is no other method than that which brute beasts are capable of, and do put in use; which is a perpetual intending or practising some one thing, urged and imposed by an absolute necessity of conservation of being: for so Cicero saith very truly, "Usus uni rei deditus et naturam et artem sæpe vincit" (practice applied to one object often outstrips nature and art). And therefore if it be said of men,

"Labor omnia vincit
Improbus, et duris urgens in rebus egestas:
(What cannot ceaseless toil, and pressing need!)

it is likewise said of beasts, "Quis psittaco docuit suum χαῖρε" (who taught the parrot to say Good morrow?) Who taught the raven in a drought to throw pebbles into a hollow tree, where she espied water, that the water might rise so as she might come to it? Who taught the bee to sail through such a vast sea of air, and to find the way from a field in flower, a great way off, to her hive? Who taught the ant to bite every grain of corn that she burieth in her hill, lest it should take root and grow? Add then the word 'extundere" (to hammer out), which importeth the extreme difficulty, and the word 'paulatim" (by degrees), which importeth the extreme slowness, and we are where we were, even among the Egyptians' gods; there being little left to the faculty of reason, and nothing to the duty of art, for matter of invention.

'Secondly, the induction which the logicians speak of, and which seemeth familiar with Plato, (whereby the principles of sciences may be pretended to be invented, and so the middle propositions by derivation from the principles;) their form of induction, I say, is utterly vicious and incompetent: wherein their error is the fouler, because it is the duty of art to perfect

and exalt nature; but they contrariwise have wronged, abused and traduced nature. For he that shall attentively observe how the mind doth gather this excellent dew of knowledge, like unto that which the poet speaketh of, "Aërei mellis cœlestia dona" (the heavenly gift of aërial honey), distilling and contriving it out of particulars natural and artificial, as the flowers of the field and garden, shall find that the mind of herself by nature doth manage and act an induction much better than they describe it. For to conclude upon an enumeration of particulars, without instance contradictory, is no conclusion, but a conjecture; for who can assure, in many subjects, upon those particulars which appear of a side, that there are not on the contrary side which appear not? As if Samuel should have rested upon those sons of Jesse which were brought before him, and failed of David, which was in the field. And this form, to say truth, is so gross, as it had not been possible for wits so subtile as to have managed these things to have offered it to the world, but that they hasted to their theories and dogmaticals, and were imperious and scornful towards particulars; which their manner was to use but as "lictores and viatores," for sergeants and whifflers, "ad summovendam turbam" (to drive away the crowd), to make way and make room for their opinions, rather than in their true use and service. Certainly it is a thing may touch a man with a religious wonder, to see how the footsteps of seducement are the very same in divine and human truth: for as in divine truth man cannot endure to become as a child; so in human, they reputed the attending the inductions whereof we speak, as if it were a second infancy or childhood.

'Thirdly, allow some principles or axioms were rightly induced, yet nevertheless certain it is, that middle propositions cannot be deduced from them in subject of nature by syllogism, that is, by touch and reduction of them to principles in a middle term. It is true that in sciences popular, as moralities, laws, and the like, yea, and divinity (because it pleaseth God to apply himself to the capacity of the simplest), that form may have use; and in natural philosophy likewise, by way of argument or satisfactory reason, "Quæ assensum parit, operis effæta est" (what produces assent, has accomplished its object:) but the subtilty of nature and operations will not be inchained in those bonds: for arguments consist of propositions, and propositions of words; and words are but the current tokens or marks of popular notions of things; which notions, if they be grossly and variably collected out of particulars, it is not the laborious examination either of consequences of arguments, or of the truth of propositions, that can ever correct that error, being, as

the physicians speak, in the first digestion: and therefore it was not without cause, that so many excellent philosophers became sceptics and academics, and denied any certainty of knowledge or comprehension; and held opinion, that the knowledge of man extended only to appearances and probabilities. It is true that in Socrates it was supposed to be but a form of irony, "Scientiam dissimulando simulavit," (he made pretensions to knowledge by dissembling it;) for he used to disable his knowledge, to the end to enhance his knowledge; like the humor of Tiberius in his beginnings, that would reign, but would not acknowledge so much: and in the latter Academy, which Cicero embraced, this opinion also of "acatalepsia" (incomprehensibleness), I doubt, was not held sincerely: for that all those which excelled in "copia" (abundance) of speech seem to have chosen that sect, as that which was fittest to give glory to their eloquence and variable discourses; being rather like progresses of pleasure, than journeys to an end. But assuredly many scattered in both Academies did hold it in subtilty and integrity: but here was their chief error; they charged the deceit upon the senses; which in my judgment, notwithstanding all their cavillations, are very sufficient to certify and report truth, though not always immediately, yet by comparison, by help of instrument, and by producing and urging such things as are too subtile for the sense to some effect comprehensible by the sense, and other like assistance. But they ought to have charged the deceit upon the weakness of the intellectual powers, and upon the manner of collecting and concluding upon the reports of the senses. This I speak, not to disable the mind of man, but to stir it up to seek help: for no man, be he never so cunning or practised, can make a straight line or perfect circle by steadiness of hand, which may be easily done by help of a ruler or compass.

'This part of invention, concerning the invention of sciences, I purpose, if God give me leave, hereafter to propound, having digested it into two parts; whereof the one I term "experientia literata" (learned experience,) and the other, "interpretatio naturæ" (the interpretation of nature): the former being but a degree and rudiment of the latter. But I will not dwell too long, nor speak too much upon a promise.

'The invention of speech or argument is not properly an invention; for to invent is to discover that we know not, and not to recover or resummon that which we already know: and the use of this invention is no other but, out of the knowledge whereof our mind is already possessed, to draw forth or call before us that which may be pertinent to the purpose which we take into our consideration. So as, to speak truly, it is no invention, but remembrance or suggestion, with an application;

which is the cause why the schools do place it after judgment, as subsequent and not precedent. Nevertheless, because we do account it a chace, as well of deer in an inclosed park, as in a forest at large, and that it hath already obtained the name, let it be called invention; so as it be perceived and discerned, that the scope and end of this invention is readiness and present use of our knowledge, and not addition or amplification thereof.'

pp. 208–218.

By 'rational knowledges,' 'arts intellectual,' and more especially by the 'invention of arts and sciences,' in the preceding extract, Bacon seems to understand something very similar to, if not precisely the same as, by 'universality' or 'philosophia prima.' Invention, such as is here referred to, acknowledges no kindred with necessity, but would do honor to the noblest pedigree. The same thing is again referred to, and perhaps more fully illustrated in the following remarks.

'But because the distributions and partitions of knowledge are not like several lines that meet in one angle, and so touch but in a point; but are like branches of a tree, that meet in a stem, which hath a dimension and quantity of entireness and continuance, before it come to discontinue and break itself into arms and boughs; therefore it is good, before we enter into the former distribution, to erect and constitute one universal science, by the name of "Philosophia prima," primitive or summary philosophy, as the main and common way, before we come where the ways part and divide themselves; which science, whether I should report as deficient or no, I stand doubtful.

'For I find a certain rhapsody of natural theology, and of diverse parts of logic; and of that part of natural philosophy which concerneth the principles; and of that other part of natural philosophy which concerneth the soul or spirit; all these strangely commixed and confused: but being examined, it seemeth to me rather a depredation of other sciences, advanced and exalted unto some height of terms, than anything solid or substantive of itself.

'Nevertheless, I cannot be ignorant of the distinction which is current, that the same things are handled but in several respects. As for example, that logic considereth of many things as they are in notion, and this philosophy as they are in nature; the one in appearance, the other in existence: but I find this difference better made than pursued. For if they had considered quantity, similitude, diversity, and the rest of those external characters of things, as philosophers, and in nature, their inquiries must of force have been of a far other kind than they are.

'For doth any of them, in handling quantity, speak of the force of union, how and how far it multiplieth virtue? Doth any give the reason, why some things in nature are so common, and in so great mass, and others so rare, and in so small quantity? Doth any, in handling similitude and diversity, assign the cause why iron should not move to iron, which is more like, but move to the loadstone, which is less like? Why in all diversities of things there should be certain particles in nature, which are almost ambiguous to which kind they should be referred? But there is a mere and deep silence touching the nature and operation of those common adjuncts of things, as in nature; and and only a resuming and repeating of the force and use of them in speech or argument.

'Therefore, because in a writing of this nature I avoid all subtilty, my meaning touching this original or universal philosophy is thus, in a plain and gross description by negative: "That it be a receptacle for all such profitable observations and axioms as fall not within the compass of any of the special parts of philosophy or sciences, but are more common and of a higher stage."

'Now that there are many of that kind, need not to be doubted. For example; is not the rule, "Si inæqualibus æqualia addas, omnia erunt inæqualia" (if to unequals you add equals, all will be unequal), an axiom as well of justice as of the mathematics? And is there not a true coincidence between commutative and distributive justice, and arithmetical and geometrical proportion? Is not that other rule, "Quæ in eodum tertio conveniunt, et inter se conveniunt" (things which are equal to a third thing, are equal to one another), a rule taken from the mathematics, but so potent in logic as all syllogisms are built upon it? Is not the observation, "Omnia mutantur, nil interit" (all things are changed, nothing perishes), a contemplation in philosophy thus, that the quantum of nature is eternal? in natural theology thus, that it requireth the same omnipotence to make somewhat nothing, which at the first made nothing somewhat? according to the Scripture, "Didici quòd omnia opera, quæ fecit Deus, preseverent in perpetuum; non possumus eis quicquam addere nec auferre" (I know that, whatsoever God doeth, it it shall be forever: nothing can be put to it, nor anything taken from it.)

'Is not the ground, which Machiavel wisely and largely discourseth concerning governments, that the way to establish and preserve them, is to reduce them "ad principia" (to first principles), a rule in religion and nature, as well as in civil administration? Was not the Persian magic a reduction or correspondence of the principles and architectures of nature to the rules and policy of governments? Is not the precept of a mu-

sician, to fall from a discord or harsh accord, upon a concord or sweet accord, alike true in affection? Is not the trope of music, to avoid or slide from the close or cadence, common with the trope of rhetoric, of deceiving expectation? Is not the delight of the quavering upon a stop in music, the same with the playing of light upon the water?

"Splendet tremulo sub lumine pontus:"

(The silver splendors tremble o'er the tides.)

Are not the organs of the senses of one kind with the organs of reflection, the eye with a glass, the ear with a cave or strait determined and bounded? Neither are these only similitudes, as men of narrow observation may conceive them to be, but the footsteps of nature, treading or printing upon several subjects or matters.

'This science, therefore, as I understand it, I may justly report as deficient; for I see sometimes the profounder sort of wits, in handling some particular argument, will now and then draw a bucket of water out of this well for their present use; but the spring-head thereof seemeth to me not to have been visited; being of so excellent use, both for the disclosing of nature, and the abridgement of art.

'This science being therefore first placed as a common parent, like unto Berecynthia, which had so much heavenly issue,

"Omnes cælicolas, omnes super alta tenentes:"

(A shining train, who fill the blest abodes):

we may return to the former distribution of the three philosophies, divine, natural, and human.'—pp. 147–152.

The distinction which is here made between 'several lines that meet in one angle, and so touch but in a point,' and 'the branches of a tree that meet in a stem, which hath a dimension and quantity of entireness and continuance,' is certainly a most important one. There is no parallelism between the two things. A branch is not, in any sense of the word, a stem. The distinction between them is the same as between cause and effect; and the science of which Bacon is speaking, and of which he certainly had some knowledge, is as a stem through which all the other sciences are to be produced, and on which they are to be supported; or it stands as 'a common parent, like unto Berecynthia which had so much heavenly issue.' When a man is in this science, the discovery of sciences which lie in the planes below where he is situated, is a matter of course. He does not stumble upon them accidentally, or by virtue of endless experiments repeated without object and leading he knows not whither, but being himself in

the causes of things, he can foresee the effects. We have already alluded to the proverb that 'necessity is the mother of invention.' In the usual mode of discovering natural science this is strictly true; and it may be added that men are mere slaves in the work. Indeed they hardly make any pretensions to rationality, any more than freedom, but follow their experiments, as it were with their eyes closed. In this respect, it is very evident that the philosophers of the present day are far behind their boasted leader. They have received his cautions against theorizing according to the strictness of the letter, without drinking into his spirit. Theories are not to be framed without regard to facts and experiments, after the manner of the ancients, and then advocated and supported from personal interest and a love of reputation. This is but another kind of slavery—the slavery of prejudice and self-conceit. Neither are facts and experiments to be collected without regard to theories. But theories should be framed from rational views of the causes which are continually operating and producing effects, and the testimony of facts and experiments should ultimately determine their character. In this manner a man may labour without toil, for he will receive strength from the consciousness of continual progress.

We regard these views as so very important, that we shall make another extract the more fully to illustrate them.

'For Natural Prudence, or the part operative of natural philosophy, we will divide it into three parts, experimental, philosophical, and magical; which three parts active have a correspondence and analogy with the three parts speculative, natural history, physic, and metaphysic: for many operations have been invented, sometimes by a casual incidence and occurrence, sometimes by a purposed experiment; and of those which have been found by an intentional experiment, some have been found out by varying or extending the same experiment, some by transferring and compounding diverse experiments the one into the other, which kind of invention an empiric may manage.

'Again, by the knowledge of physical causes there cannot fail to follow many indications and designations of new particulars, if men in their speculation will keep one eye upon use and practice. But these are but coastings along the shore, "premendo littus iniquum" (keeping too close to the dangerous coast): for, it seemeth to me, there can hardly be discovered any radical or fundimental alterations and innovations in nature,

either by the fortune and essays of experiments, or by the light and direction of physical causes.

'If, therefore, we have reported metaphysic deficient, it must follow that we do the like of natural magic, which hath relation thereunto. For as for the natural magic whereof now there is mention in books, containing certain credulous and superstitious conceits and observations of sympathies, and antipathies, and hidden properties, and some frivolous experiments, strange rather by disguisement than in themselves; it is as far differing in truth of nature from such a knowledge as we require, as the story of king Arthur of Britain, or Hugh of Bourdeaux, differs from Cæsar's Commentaries in truth of story. For it is manifest that Cæsar did greater things "de vero" (in reality) than those imaginary heroes were feigned to do; but he did them not in their fabulous manner. Of this kind of learning the fable of Ixion was a figure, who designed to enjoy Juno, the goddess of power; and instead of her had copulation with a cloud, of which mixture were begotten centaurs and chimeras.

'So whosoever shall entertain high and vaporous imaginations, instead of a laborious and sober inquiry of truth, shall beget hopes and beliefs of strange and impossible shapes. And therefore we may note in these sciences which hold so much of imagination and belief, as this degenerate natural magic, alchemy, astrology, and the like, that in their propositions the description of the means is ever more monstrous than the pretence or end.

'For it is a thing more probable, that he that knoweth well the natures of weight, of colour, of pliant and fragile in respect of the hammer, of volatile and fixed in respect of the fire, and the rest, may superinduce upon some metal the nature and form of gold by such mechanic as belongeth to the production of the natures afore rehearsed, than that some grains of the medicine projected should in a few moments of time turn a sea of quicksilver or other materials into gold: so it is more probable, that he that knoweth the nature of arefaction, the nature of assimilation of nourishment to the thing nourished, the manner of increase and clearing of spirits, the manner of the depredations which spirits make upon the humors and solid parts, shall by ambages of diets, bathings, anointings, medicines, motions, and the like, prolong life, or restore some degree of youth or vivacity, than that it can be done with the use of a few drops or scruples of a liquor or receipt. To conclude, therefore, the true natural magic, which is that great liberty and latitude of operation which dependeth upon the knowledge of forms, I may report deficient, as the relative thereof is.

'To which part, if we be serious, and incline not to vanities

and plausible discourse, besides the deriving and deducing the operations themselves from metaphysic, there are pertinent two points of much purpose, the one by way of preparation, the other by way of caution: the first is, that there be made a calendar, resembling an inventory of the estate of man, containing all the inventions, being the works or fruits of nature or art, which are now extant, and whereof man is already possessed; out of which doth naturally result a note, what things are yet held impossible, or not invented: which calendar will be the more artificial and serviceable, if to every reputed impossibility you add what thing is extant which cometh the nearest in degree to that impossibility: to the end that by these optatives and potentials man's inquiry may be the more awake in deducing direction of works from the speculation of causes: and secondly, that those experiments be not only esteemed which have an immediate and present use, but those principally which are of most universal consequence for invention of other experiments, and those which give most light to the invention of causes; for the invention of the mariner's needle, which giveth the direction, is of no less benefit for navigation than the invention of the sails, which give the motion.

'Thus have I passed through natural philosophy, and the deficiencies thereof; wherein if I have differed from the ancient and received doctrines, and thereby shall move contradiction,—for my part, as I affect not to dissent, so I purpose not to contend. If it be truth,

"Non canimus surdis, respondent omnia sylvæ:"
(Not to the deaf our notes in vain we sing,
Each wood shall with responsive echoes ring.)

The voice of nature will consent, whether the voice of man do or no. And as Alexander Borgia was wont to say of the expedition of the French for Naples, that they came with chalk in their hands to mark up their lodgings, and not with weapons to fight: so I like better that entry of truth which cometh peaceably, with chalk to mark up those minds which are capable to lodge and harbor it, than that which cometh with pugnacity and contention.'—pp. 172–177.

We here have a very clear expression of Bacon's opinion in relation to those discoveries which are made by the light of physical causes. The natural magic which he speaks of, seems to be but another name for his 'philosophia prima.' It is indeed a most remarkable fact, that so large a portion of the professed followers of Bacon, and those too who are perpetually boasting of the grand discoveries of the inductive system, should be men who ascend no higher than physical

causes, and suppose that they honour him as their master in philosophy, while they profess to do no more. It is useless to reason with such men, but if they could be persuaded to read a single volume of Bacon's works, they would find him to be quite a different man from what they suppose. The exalted sentiment, which fills the concluding paragraph last quoted, must be interesting to those who can appreciate the state of him who wrote it. To those who cannot, nothing which we could add, would render it interesting or intelligible.

Bacon repeats the Fable of Æsop, respecting the husbandman, that,

'When he died, told his sons, that he had left unto them gold, buried under ground in his vineyard; and they digged over all the ground, and gold they found none; but by reason of their stirring and digging the mould about the roots of their vines, they had a great vintage the year following.'—pp. 50, 51.

We fear that our remarks in relation to the state of modern philosophy may be imputed by some to ungenerous or envious motives, and by others may be misunderstood. We therefore refer to this fable, as well calculated to illustrate our meaning. While the husbandman is digging for gold, he may indeed essentially benefit his lands. But his labour is the vilest drudgery. He is the constant dupe of expectations which are never to be gratified, and of hopes that are never to be realized. He does not indeed labour altogether in vain; but he is a slave, because he knows neither the amount nor the nature of his wages. Now what we intended to say was, that the philosophers of the present day, have lost the spirit of Bacon. They are conversant only with effects. They are toiling and labouring to as little purpose, or to a purpose as wide of their expectations and hopes, as was the husbandman in the fable. And what we would have them to become, is, comparatively speaking, what every one sees that he should have been. They should be in a state to 'know in some general form' that which they are in pursuit of. There is a science as appropriate to the experimental philosopher, as the science of agriculture is to the husbandman; and this is what Bacon terms 'Philosophia prima' or the 'invention of arts and sciences.'

In the following passage we see what Bacon regarded as necessary in order to the cultivation of this heart and root of

philosophy. We see also another proof of his high estimation of the dignity and value of true learning.

'First, therefore, amongst so many great foundations of colleges in Europe, I find strange that they are all dedicated to professions, and none left free to arts and sciences at large. For if men judge that learning should be referred to action, they judge well; but in this they fall into the error described in the ancient fable, in which the other parts of the body did suppose the stomach had been idle, because it neither performed the office of motion, as the limbs do, nor of sense, as the head doth; but yet, notwithstanding, it is the stomach that digesteth and distributeth to all the rest: so if any man think philosophy and universality to be idle studies, he doth not consider that all professions are from thence served and supplied. And this I take to be a great cause that hath hindered the progression of learning, because these fundamental knowledges have been studied but in passage. For if you will have a tree bear more fruit than it hath used to do, it is not anything you can do to the boughs, but it is the stirring of the earth, and putting new mould about the roots, that must work it. Neither is it to be forgotten, that this dedicating of foundations and donations to professory learning hath not only had a malign aspect and influence upon the growth of sciences, but hath also been prejudical to states and governments. For hence it proceedeth that princes find a solitude in regard of able men to serve them in causes of state, because there is no education collegiate which is free; where such, as were so disposed might give themselves to histories, modern languages, books of policy and civil discourse, and other the like enablements unto service of state.

'And because founders of colleges do plant, and founders of lectures do water, it followeth well in order to speak of the defect which is in public lectures; namely, in the smallness and meanness of the salary or reward which in most places is assigned unto them; whether they be lectures of arts, or of professions. For it is necessary to the progression of sciences that readers be of the most able and sufficient men, as those which are ordained for generating and propagating of sciences, and not for transitory use. This cannot be, except their condition and endowment be such as may content the ablest man to appropriate his whole labour, and continue his whole age in that function and attendance; and therefore must have a proportion answerable to that mediocrity or competence of advancement, which may be expected from a profession or the practice of a profession. So as, if you will have sciences flourish, you must observe David's military law, which was, "That those which

staid with the "carriage should have equal part with those which were in the action;" else will the carriages be ill attended. So readers in science are indeed the guardians of the stores and provisions of sciences, whence men in active courses are furnished, and therefore ought to have equal entertainment with them; otherwise, if the fathers in sciences be of the weakest est sort, or be ill-maintained,

"Et patrum invalidi referent jejunia nati:"
(From feeble fathers spring imbecile sons.)'

pp. 109–111.

One reason why more serious efforts have not been made to place philosophy and universality upon a solid and true foundation is, because they hold out but a small prospect of an early reward. The prosecution of them as studies promises much in the way of important results; but these encouragements are not in their nature of an imposing character. We now speak of philosophy, in the general, abstract sense, in which Bacon used the word. And by results we mean those external, natural effects, which terminate in mechanical operations, and become immediate sources of pecuniary profit, and attract the admiration of the multitude. Results of this character, together with those which are merely striking and showy without being useful, are always gratifying to the pride and ambition of pretended philosophers. And perhaps we ought to add, that the genius of the laws and institutions of this country, especially when regarded in connexion with the present state of society, is such as to expose us to a double share of this failing. We do not love to investigate matters thoroughly. Everything around us is, in a certain sense, immature. We have not well considered the importance of a good digestion. We insist upon having the profits; and we are often gathering and counting our fruits, while we should be stirring the earth about the roots of the tree, and putting in new mould, that it may become ripe and mellow upon its native bough. It is the same disposition which leads us to make philosophy a sport. In this way it has come to be the profession of many to teach it, who know little of its power. We have lectures upon the several departments of natural philosophy, which consist merely of an artificial arrangement of technical terms, and the repetition of dazzling experiments, without attempting to teach the pupils to abstract their views and reason for themselves. We do not object to experiments for the illustration of principles; nor to familiar instruction in

the elements of natural philosophy. But we do most seriously object to regarding every one as a philosopher who uses the elementary terms of science with familiarity, and lectures to the astonishment of a popular audience. Philosophy has not thus descended from her true station. She has indeed come down to labour in the common walks, and for the common benefit of man; and she has clothed herself in a garment suited to her employment. But let us not suppose that she has therefore changed her essential character. Though we see her engaged in more external works, let us not forget her heavenly origin, nor whence it is that she derives her power. It is impossible from the very nature of the case, that she should do these things without bestowing, upon her false pretenders, the power of deceptive imitations. The power of jugglery and enchantment has been coexistent with the power of working miracles. But all this only increases the necessity for a spirit of true discrimination.

This love of show, for which many pretended scholars are more remarkable, than for their love of philosophy and true learning, did not escape the notice of so keen an observer as Bacon. A single paragraph will suffice to show his estimation of such arts.

'There hath been also laboured and put in practice a method which is not a lawful method, but a method of imposture; which is, to deliver knowledges in such manner, as men may speedily come to make a show of learning who have it not: such was the travail of Raymundus Lullius, in making that art which bears his name; not unlike to some books of typocosmy which have been made since; being nothing but a mass of words of all arts, to give men countenance, that those which use the terms might be thought to understand the art; which collections are much like a fripper's or broker's shop, that hath ends of every thing, but nothing of worth.'—p. 247.

Bacon also complains of the habit of a too hasty a reduction of knowledge to arts and methods. But the best idea of his meaning will be derived from his own words.

'Another error, of a diverse nature from all the former, is the over early and peremptory reduction of knowledge into arts and methods; from which time commonly sciences receive small or no augmentation. But as young men, when they knit and shape perfectly, do seldom grow to a farther stature; so knowledge, while it is in aphorisms and observations, it is in growth;

but when it is once comprehended in exact methods, it may perchance be farther polished and illustrated, and accommodated for use and practice; but it increaseth no more in bulk and substance.'—p. 55.

It may be said indeed in reply to this caution, that his own principles of theorizing have provided an adequate remedy. Theories are now held as resulting from, and resting upon actual facts and observations. Of course, whenever any new facts are disclosed which prove to be at variance with a pre-established theory, the theory is at once set aside. One of the foundations upon which it was acknowledged to stand, has been removed, and all those who made this acknowledgment truly, must admit that it stands no longer. This is, in a certain sense, true. Still there is much truth in the paragraph last quoted, the force and propriety of which lies a little deeper than the level of such a reply seems to contemplate. Perhaps we shall most easily succeed in explaining our meaning, if instead of the arts and sciences as they exist in the abstract form, we regard them for a moment, as they exist in the mind of a single individual. And, if instead of the 'reduction of knowledge into arts and methods,' by the common consent of scientific men, or instead of the common, universal progress of knowledges into arts and sciences which is going on in the learned world, we regard the progress of these things in a single mind. For it is to be recollected that every man has a certain process to go through by himself, before he can truly understand any science. And there is a close analogy between this process, in every step, and the process of the science itself in the abstract. For the abstract science itself, at least so far as any idea can be formed of it, is nothing but a collection of those truths and knowledges which different individuals have first seen by themselves. These are arranged and systematized and preserved in printed books. The facts may all exist on which the system is founded. But it must be obvious that it does not follow that the arrangement and inferences are all true. While a pupil is learning a science, he should endeavour to receive from his instructer as little as possible of that which is peculiar to him as an individual, in the form and arrangement of his own thoughts. He should thus acquire the abstract principles of a science which are to be filled with life and moulded into a particular form, by himself. The moment he follows his master beyond this, he becomes a slave without

the slightest probability that his labours will be either useful or productive. The seeds must be sown in his own mind, which like the earth must first produce the tree, before it can bear the fruit. On this point it is obvious that great care in the instructer is requisite lest the pupil should neglect to do that for himself, which alone can make him a philosopher. Now the 'arts and methods' of knowledge, as Bacon terms them, are the instructers of us all. There are certain general properties of science in which all philosophers of the age agree. And when these have become settled and reduced to exact methods, they are very likely to retain their features, whether they are the fair expression of the simple truth or not. It requires more than ordinary strength of mind to rise above their influence. It is in fact the very thing which Bacon did in his age, and for which we honour his memory. But we should honour his principles still more in endeavouring to remove all improper influences from this source. We are not to receive theories and inferences, because he who proposes them calls himself a Baconian philosopher. But we must endeavour to elevate our understandings so as to see them for ourselves, and thus become ourselves philosophers in the true sense of the term. We shall then enter into theories, and instead of repeating what we have heard others say, shall be able to speak what we have ourselves seen.

In connexion with this part of the subject the memory is too remarkable a power of the mind to be passed over in total silence. There is no power of the mind which has been less understood or more perverted from its true uses. We have not time to pursue an inquiry into the nature of these uses, but quote a paragraph to show at least in a negative form, what Bacon's views were in relation to it.

'For the other principal part of the custody of knowledge, which is memory, I find that faculty in my judgment weakly inquired of. An art there is extant of it; but it seemeth to me that there are better precepts than that art, and better practices of that art, than those received. It is certain the art, as it is, may be raised to points of ostentation prodigious: but in use, as it is now managed, it is barren, (not burdensome, nor dangerous to natural memory, as is imagined, but barren,) that is, not dexterous to be applied to the serious use of business and occasions. And therefore I make no more estimation of repeating a great number of names or words upon once hearing, or the pouring forth of a number of verses or rhimes extempore, or the

making of a satirical simile of everything, or the turning of everything to a jest, or the falsifying or contradicting of everything by cavil, or the like, (whereof in the faculties of the mind there is great "copia" (plenty,) and such as by device and practice may be exalted to an extreme degree of wonder,) than I do of the tricks of tumblers, funambuloes, baladines; the one being the same in the mind that the other is in the body, matters of strangeness without worthiness.'—pp. 231, 232.

We cannot conclude this article without asking pardon of the reader, (if indeed we have one who has followed us through,) for the irregular manner in which this notice has been conducted. We are well aware that it is far from being what it ought to have been. But, such as we have been able, under peculiar circumstances, to make it, it is given; in the hope that the extracts, which are certainly valuable, will induce a more general examination of the writings of the father of modern philosophy.

ART. II.—*Errors in Common Education. An Address delivered at the Lyceum in Brooklyn, Con. Oct. 22, 1828, by S. J. May.*

[Few means seem better adapted to produce extensive improvement in common education, than the discussion of the principles on which it is, or ought to be, conducted. Our books for the use of schools are, with a few exceptions, very defective. But our prevailing methods of intruction are still more objectionable, than the manuals on which they are founded. The preparing of proper books for elementary tuition, has been a process rather slow in its developements. The first step of progress was the cutting down of great volumes into small ones, by the short-hand method of abridging; the language being suffered to remain as it stood originally, when intended for adults. The next step, was the additional one of writing down the phraseology to the level of infant capacities. A third advance consisted, in giving the thoughts, as well as the language, a familiar air, and an interesting form. A fourth stage of improvement seems now to be entered on, which is that of not only changing the aspect

and the dress in which thought is presented to the young minds, but the re-arranging of the thoughts themselves, so that their order and succession form a gradual and natural exercise of the mental faculties, and a silent, progressive, and practical course of intellectual discipline,—indicating at the same time, the path to be pursued in all endeavours for the attainment of knowledge.

With the exceptions of Colburn's Arithmetic, and those on the same plan, very little aid, in common education, has been derived from works written on rational principles of instruction; and the school books in common use, imperfect as they are in themselves, have been rendered still worse, as instruments of instruction, by the mechanical modes of teaching, to which they have been rendered subservient. These evils need to be freely and often stated, that they may be brought fully before the minds of those who have influence in education.

Of the following address, we had occasion to speak in our last number. Deeming the views disclosed in it important to teachers and parents, we have obtained the author's permission to insert it in our pages. It is now presented with some modifications which he has obligingly made with a view to the objects of this journal. On behalf of this article it is unnecessary for us to say any thing. Its subject is one of universal importance, and is treated with a clearness and distinctness of manner, which cannot fail to carry light and conviction to minds accustomed to reflection on practical subjects.]

Education, in its broadest sense, may be understood to mean the complete and harmonious developement of all the intellectual and moral powers of our nature—the subjection of ourselves to the supreme control of right principles, and the acquisition of all knowledge that may be necessary, in order to our filling well the sphere of duty, in which God hath placed us. Thus defined, it is the *great purpose* of this present state of our being. It is the work, which ought to be in continual progress, until, in the providence of God, we are deprived of our faculties. As we advance into life, multiply our relations to mankind, and assume new responsibilities, increased demands of one kind or another are, of course, made upon our minds and hearts. These render it necessary for us to seek higher acquisitions of knowledge, and to ponder anew, the correctness of our moral principles, in their operation upon new classes of duty. And thus the process of education goes on, or rather should go on, towards perfection.

It would be well for us often to take this extended view of education, because it is only when we contemplate the whole, that we can form just ideas of its subordinate parts. A principal source of the errors in common school teaching, to which I shall presently direct your attention, is, if I mistake not, a want of prospective reference to education in its enlarged sense. To whatever extent it may be probable this process will be carried in after life, the *commencement* of education ought in every instance to be the same; that is to say, it ought in every instance to be such, as shall have a direct tendency to the grand result. So that any one, however humble be his origin, may be set out in that course, which, if his talents and opportunities in life permit him to pursue it, may lead him to the highest attainments in knowledge and virtue. In one word, the specific object of elementary instruction in every instance should be, *to begin that harmonious developement* of all the powers of our nature, which, if we do not paralyze them by our sins, will be expanding forever.

These introductory thoughts are, I am too well persuaded, very unlike the notions generally entertained on the subject before us. Most persons seem to consider a common education to be nothing else than the acquisition of a certain verbal familiarity with language, grammar, geography and arithmetic. Whether all these branches of science should be introduced into our common schools, in preference to others which are wholly neglected, admits a question of serious import. But I shall not now stop to consider it. I am not disposed to find so much fault with the branches, which, it is pretended, are taught to children, as with the manner in which instruction is generally given—a manner unfriendly, I am confident, yes, utterly incompatible with the attainment of a thorough, practical knowledge of either of these sciences, and tending scarcely at all to that unfolding of mind and heart, in which, as has been already said, real education consists. The study of some sciences is undoubtedly a better discipline of the mind, than the study of others; but any subject of knowledge may become, in the hands of a skilful master, instrumental to the expansion of most of the mental faculties. I have seen one, who understands the art of teaching, make even a twig of a rose-bush the source of much valuable truth, which, in a most natural process, he led his infant pupils to gather for themselves, by the exertion of their own intellectual powers. The close attention they voluntarily gave him—the eagerness

with which their minds seemed to follow out the little trains of reflection or reasoning that he started, showed most plainly, that no enjoyment is higher, even to a very young mind, than the real pursuit of truth.

That this is the fact, we may also infer from the almost insatiable curiosity children evince, when a new object is presented to their notice—the succession of questions they will ask, in order to elicit from you what they wish to know. An attempt on their part which is, alas, often fruitless, because parents or teachers are too indolent, or too busy, or too ignorant to impart the information they solicit. After being thus disappointed again and again—and perhaps reproved for impertinence, many children learn to suppress their curiosity, refrain from inquiry, and are persuaded or compelled in silence, to commit to their memories words, to which they affix no correct ideas, concerning things, about which they are wholly ignorant. Now, my friends, it should never be forgotten, that the curiosity of a child—the inquiries he makes—are the index of his mind; they direct us to the very point, where our assistance is needed. In teaching a child therefore, we ought first to *awaken curiosity*, excite thought about the subject with which we wish him to become acquainted; and should encourage his questions so long as they are evidently suggested by the desire of *knowing* something more. Whenever his question relates to a fact whch he does not possess, that fact must of course be communicated to him, and impressed upon his memory; but if his question may be answered by inferences from facts which he is known to possess, then we ought to lead him by a simple course of reasoning or reflection, to draw those inferences for himself. Thus while he is acquiring knowledge, he will be learning what is better, *how to use* his intellectual powers; and these will be strengthened by every effort he is induced to make with them.

This plan, or something like it, I have seen pursued with complete success in the instruction of very young children. Indeed, it is the basis of the method pursued in Infant Schools, as they are called, which embrace children between the ages of two and six years. These schools are of recent origin, but have awakened great interest both in this country and England; and have already repaid, a hundred fold, the expense of their support, by the disclosure of facts important to the science of teaching, and by the happiness they have diffused, wherever they have been established.

Who, that ever feels compassion, can look into our *common* schools for small children, and not have his compassion strongly excited, especially if he retain any recollection of his own feelings, when he was subjected to the same dull trial of his patience. There the little creatures are ranged on uncomfortable benches, condemned to sit still, if possible, perhaps with their hands folded, the greater part of three long hours in each half day, *literally doing nothing*, at the very time of life, when activity of mind and body are most congenial to them. No attempt is made to excite thought, to communicate ideas, to awaken curiosity, to impart knowledge. It is even doubted if they are capable of receiving much instruction; and the avowed reason for sending them to school, is to keep them out of mischief or harm's way, or to alleviate their mothers' care. For months, and perhaps for a whole year, they are kept drilling upon the alphabet, an assemblage of strange figures, as unintelligible to them as the hieroglyphics of Egypt; and afterwards, for another year, must pore over columns of syllables and words, of which not one in twenty can they understand.

Through all this darkness, without one gleam of intellectual light to cheer them, children are persuaded to persevere by dint of praise, and emulation, and cakes and kisses—or, by the sterner sort of pedagogues are compelled to toil, through fear of the rod, the fool's cap, or longer confinement in the hated school-house.

Oh! who, that is a parent, does not wish that some more inviting path to knowledge may be opened for his children? Who, that knows anything of the human mind, does not grieve, that it is commonly subjected to such evil influences, at the very time when it is most susceptible?

If now we turn our attention to the other branches, which it is pretended are taught in our common schools, we shall find that the same erroneous method is pursued with them also. The memory is the faculty chiefly called into exercise. This is required to crowd itself with technical terms and definitions, that are as unintelligible as the things they purport to explain; so that a crude mass is collected, which few minds are afterwards able to digest, or reduce to any useful purpose.

For example, in teaching grammar—the first step is, for the pupil to commit to memory the parts of speech, with their definitions; then, the variations to which those parts of speech are subjected by number, gender, case, mood, and tense; and then, the relation that words may sustain to each other, when

arranged into sentences. Now, all these things will be riddles to the learner, until after he has become familiar with the usages of correct language, by much reading of well-written books. The time, therefore, which is usually spent by children in committing to memory some treatise on grammar, is little better than wasted. If the same time were expended in reading with care, specimens of correct and elegant English—in ascertaining precisely the meaning of sentences—particularly observing those that may be at all peculiar in their structure; if the time, I repeat, usually spent in learning to recite the pages of Murray, were faithfully employed in the manner suggested, I am confident the pupil would acquire incomparably more knowledge of the language, and would much sooner learn to use it with greater accuracy than most of our common school taught grammarians do; besides which, he would be more likely to obtain the *very rare* accomplishment of reading well. In proof of what has been said, I might point you to certain persons, who write with a good degree of propriety and even elegance, though they never learnt anything about the technics of grammar; while, on the other hand, you all undoubtedly know many persons, claiming to be very familiar with orthography, etymology, syntax, and prosody, yet habitually, both in speaking and writing, outrage some of the first principles of language.

It may be very proper, indeed it is indispensible to a finished education, that one should learn the science of grammar; but I am persuaded the common method of teaching it is most unnatural, and therefore so often unsuccessful.

Mistakes of the same kind are made in teaching geography. Here, too, the common way is to begin with the technics—the general principles—the great outlines of the science. The learner is first introduced to a very summary account of the solar system, of which the earth is a member. He is required to commit some sentences about the theory of Copernicus, which he is *taught to say*, is the true system; about planets and their secondaries, fixed stars, and comets; about the dimensions of some of the heavenly bodies, their distances from the sun, their annual and diurnal revolutions; and perhaps a few words respecting Newton's hypotheses, to account for their suspension in the heavens, and the regularity of their motions, that is, the attraction of gravitation, and centrifugal and centripetal forces—all which, must be very intelligible to a young beginner, quite as much so, as the extraction of the

cube root would be to one, who had never learnt the four simple rules of arithmetic. Here, I will take the liberty to introduce an anecdote, much to my purpose. A little boy, who had made some progress in the study of geography, repeated to a friend of mine, with great verbal accuracy, all he knew about the heavenly bodies. My friend, knowing that sound does not always denote sense, asked him what the heavenly bodies are, a question not in the book. The little fellow was somewhat puzzled, 'when good folks die sir, they go to heaven, and then they are called heavenly bodies.' This answer certainly evinced power of thought and reasoning; though it was evident his instructer had taken no pains to improve these faculties of his mind. The mistake of the boy is easily accounted for, if he had ever read or heard anything about the heathen gods and goddesses, Jupiter, Mercury, Venus, Mars and Saturn.

When the learner has become able to repeat, to the satisfaction of his teacher, all that the author of the book he studies, has thought proper to impart, respecting the solar system, he is next introduced to the earth; to a detail of its natural, artificial, and civil divisions. He must commit to memory several pages about its great and less circles, the equator, ecliptic, meridians, parallels, zones, tropics, colures; and all this, be it remembered, without a globe to aid his perception of the meaning of these terms. Then he must learn the definitions of a continent, island, isthmus, promontory, &c., of an ocean, sea, lake, gulf, river, &c &c. To these he must add the civil divisions of the earth, its empires kingdoms, duchies, provinces, states, counties, towns. Now all these things, it is doubtless necessary he should know; but I contend it is not right to make him learn these things first. They would come in, at a later period, more naturally, and would then be more intelligible. But to proceed; when the pupil has stored his memory with the above-named technics, (and many more that might have been mentioned,) without understanding half of them, he is next presented with descriptions of various parts of the earth. In the course of this survey, he may perhaps be brought for the first time into the vicinity of his home, his country, state, perhaps county. Here, however, he is not permitted to tarry long, not long enough to learn what every one ought to know, respecting the region in which he lives. He is hurried away to other parts of the earth, and is required to learn one detail after another, of the situa-

tion, extent, boundaries, civil divisions, climate, population, soil, and productions of this country and that, until in this summary way, the author has carried him, as he fancies, around the circle of the science. And when he has completed it, it is too probable the pupil is possessed of very little more practical knowledge of the matter, than when he began. Often have I met with those, who could tell me much about the situation and peculiarities of the Nile or the Ganges, but were utterly ignorant of the rise, course, and general characteristics of our own Quinnebaug; and with others, who knew very well the number of inhabitants in France, but were at a loss when I askd for the number in Windham county. Many a child, I fear, taught in our common schools, who may delight his parents, and gratify his own and his instructer's vanity, by his rapid answers to the common routine of questions in geography, would be found sadly deficient on a more thorough examination.

Some improvements, I grant, in the mode of teaching this science, have already been introduced into our schools. Maps are used much more than formerly, but not yet so much as they ought to be. As to *globes*, I have never seen, or heard of, but one, in all the schools in this region. Now it is not to be doubted, that in the natural sciences, a model, a picture, or any illustration addressed to the eye, will do much more towards impressing a truth upon the mind, than the most elaborate verbal description. Maps and globes are therefore indispensable in teaching geography,—the learner should have them before him continually. But geography is still taught too much without them—*by rote*—and in the otherwise unnatural manner I have attempted to describe. Instead of which, the learner ought to begin with his own town, county, state, country, and thence proceed to more distant parts of the world, aided all along by good maps, and an occasional recurrence to a globe. Afterwards, he may be taught that the earth is a planet, belonging to the system, of which the sun is the centre; and so on may be led, as far as you please, in the delightful study of this glorious universe.

The common method of teaching arithmetic is not any better, than we have seen it to be in geography and grammar. General rules, abstract principles, tedious definitions are first presented to the learner; and when he has committed them faithfully to memory, they are useless, until his instructer actually takes the slate and pencil, and *shows* him by an example,

how he must operate with the figures before him. I question, if there ever was a boy, who learnt to perform the simple rules of arithmetic, from the directions given in his book, unaided by some visible illustration of the process. Yet there is nothing difficult in these first principles of the science. The relations of numbers, which they disclose, are not arbitary, nor artificial. They are not established by prescription. They exist in the very nature of things; and every child may be led to discover them, by the powers of his own mind, if the right method be pursued, that is, if only such numbers as he can comprehend, be first presented to him. When he has thus found out that such relations do subsist between small numbers, he will readily conceive that they subsist also between larger ones; and may be led on step by step, to manage, without perplexity, the largest combinations of figures, making use, as he may need, of the various helps and expedients, which mathematicians have devised for operating with numbers, that cannot be embraced by the mind at once.

For want of some such lucid method of teaching arithmetic, how often do we find those, who have been 'clear through Dabol's,' or some other common book of the kind, and yet know nothing about the *principles* of the science, and are therefore unable to apply them in cases, which do not happen to be obviously similar to the examples given in the book. Other elementary treatises on this science are used in some places, which I wish might be speedily introduced among us—Colburn's and Smith's. The latter is constructed in part, the former wholly, on the natural and rational method, at which I have just now hinted.

I should offer you much more on this, and the other branches of common school education, were it not that by so doing I might encroach upon the provinces, which those, who follow me, intend to occupy. Four gentlemen have engaged to address the public, in succession, upon the several sciences taught in our schools. I trust it will be the aim of each one to exhibit to you, more fully than I have done, the errors committed in teaching the branch, on which he treats; and that he will set before you in detail some better method, illustrated by pertinent examples.

The substance of what I have said is as follows. Teachers in our common schools generally, and almost all the elementary books used by them, adopt a method inverse to that which nature points out. Learners are required to begin with *gener-*

als, and thence descend to *particulars*, whereas the opposite course should be pursued. The nature of the human mind suggests the propriety of taking the opposite course ; indeed it is thus the mind, if left to itself, would be obliged to seek knowledge on any subject. It must first consider particular things, which come under its observation ; thence, extend its notice to other particulars more or less resembling the first—and by comparing one individual with another, is led to form *classes* of truths. By examining and comparing these again, it is enabled to form larger divisions ; and hence proceeds to *general* and *abstract* ideas. It seems to me therefore very obvious that, in teaching the young any thing, we ought to begin with the consideration of what they already know, or may easily ascertain : and so on step by step, from that which is most easy to those things, which are more difficult to be understood, continually requiring them to exert their own powers to discover what we wish them to know ; and this we may enable them to do, if we approach the truth in a simple natural manner ; being careful that they understand, as they advance, every preliminary.

Few seem to be aware, that instruction is an art, which requires on the part of the teacher an acquaintance with the human mind, and a careful observation of its workings, under the process to which it must be subjected in order to learn any science. Most persons think it enough to put the elementary book into the hand of the pupil, and exact from him a *memoriter* recitation of successive portions, until the whole be gone over. But in most cases, this will be *only* an excercise of the memory, and may be well accomplished, while the pupil remains wholly ignorant of the subject, on which the book treats. The mind may be filled with words, and at the same time very empty of ideas.

This leads me to another remark, which indeed has been anticipated, in much that I have said. It is, that the memory alone is in any great measure developed by the common mode of education. The other intellectual powers are suffered to lie dormant, although occasions for their exercise must be occurring continually. As fast as the memory can receive them, facts and inferences are crowded indiscriminately into it. Whether pupils can or cannot understand, at the time, what they are learning to repeat, is considered of little consequence ; for it is sapiently said, when they come to years of discretion, they can examine the stock of materials they are now gathering,

and reduce them to order and use. But, as we have seen, the other powers of the mind never having had any proper cultivation—*habits* of reflection, comparison, discrimination, and judgment never having been *acquired*—these faculties, in very many, seem to remain inactive through life ; and the facts and opinions, which in childhood and youth were stored in the memory, lie there forever a confused and useless mass.

As I profess to be speaking of the prominent errors in the common mode of teaching, practised in our schools, it will not do to pass by the important art of reading, with only the slight allusion I have made to it. The great leading error, which we have exposed in the manner of teaching every other branch, becomes peculiarly apparent in this. It is impossible for one to *read well* what he does *not understand*. Now as most of our instructers seem not to consider it an indispensable part of the office they engage to execute, to be careful that their pupils understand whatever they are directed to learn ; so they allow them to read, day after day, and month after month, passages from which they probably receive no very definite ideas ; until at last their pupils come to suppose, that the whole art of reading consists in calling words correctly and rapidly, in the succession in which they may happen to stand. This is, in fact, all that the greater part do acquire. To utter in *appropriate and agreeable sounds*, the thoughts which are set down on the printed or written page, is an accomplishment which few possess. This must be attributed, in the first place, to the fact, that learners are generally allowed to pronounce the words without attending to their meaning ; and secondly to the fact, equally well known, that very little if any pains are taken to cultivate the powers of the voice. In this last named respect there are too many instances of shameless negligence. We all know persons going through life, some of them public speakers, with great defects of utterance, which might and ought to have been remedied when they were children. If more care be taken now in this repect than formerly, it is unknown to me.

While on the topic of reading, I cannot but point your attention particularly to an evil, which I have often noticed with the deepest regret, because it is injurious to our children n a more important respect than any other. I mean the manner in which the New Testament is permitted to be read in our schools. There are perpetually recurring, in this sacred volume, words, phrases, and allusions which, all know, need much

explanation. Yet children are required to read it through and through, without any attempt being made to render it intelligible to them. The evil of which I complain would be less, if the *easier* parts were selected for their perusal. But, if I mistake not, they are led through the whole ; the most obscure passages in St. Paul's Epistles, which the apostle Peter himself found it hard to understand, and even through the Apocalypse, which the most learned theologians are still at a loss to explain. Nor is this all. In most schools, which I have visited, the pupils have been directed to read a certain number of *verses* apiece, say two or three, as if each verse were a complete sentence. Yet this is most obviously not the case. The divisions into chapters and verses were made many hundred years after the books were written, merely for the sake of an easier reference to any passage. But they were unfortunately made with little care ; for very often parts of a sentence are thrown into different verses, and sometimes even into different chapters. In consequence, it is most hazardous to the sense of these writings, to be guided in reading them at all by these divisions. Yet you may every day hear them read in our schools, in portions of two or three verses, without any regard to the sense, and in utter defiance of commas and semicolons. Thus, the most momentous truths, and sublime doctrines, that have ever been communicated to the human mind, are gabbled over merely as an exercise in what is called reading. Hence, the pupils contract a habit of perusing the sacred volume without attending to the sense, a habit which they can perhaps never afterwards wholly correct. Or, what is still worse, they come to regard it as an unintelligible, or uninteresting book ; and in after life, rather turn from than seek its pages.

I might continue much longer on this strain of complaint ; but I fear you will be weary of me. If what has been said be true, the reason is obvious, why so many children regard learning as an irksome task, and the school-house a place of dull confinement. The mind and heart are suffered to slumber there ; the mental powers, except the memory, gain no strength, no activity ; and our children are growing up strangers to the delights of elevated thought, clear reasoning, and accurate information. A disrelish for intellectual pursuits is acquired at the very place, where the love of them ought to be cherished ; and even the desire of knowledge seems, in many instances, to be utterly extinguished.

I wish there were time for me to speak, in this connexion of

the errors observable in the *moral discipline* of our children. These also are numerous and great, but I must defer the consideration of them to some other occasion.

The reform, so much needed in our common schools, cannot be effected in a day. It must take time to eradicate abuses which time has nurtured. But every man who loves his country or his kind, will heartily cooperate in the measures that will tend to a result so devoutly to be wished. It is cause for grateful joy, that so many minds and hearts are now engaged in the inquiry, 'how the standard of common education may be raised.' The public mind needs to be enlightened, the public feeling to be awakened. Every parent should know that he cannot confer so great a blessing upon his children as *a good education*. Every member of the community should know, that the hopes of our country are vested in the characters of our youth. All must be brought to feel, that the education of the rising generation is the most important of all our common interests. Then will it receive the attention and the patronage which it deserves.

ART. III.—*The Orthography of the English Language Simplified.*

[At the request of the author we have permitted the insertion of the following article, on an improved orthography, entire. A simpler orthography of our language is highly desirable. Its practicability is very doubtful.]

The Orthography of the English Language Simplified, and adapted to the general standard of Pronunciation. Intended greatly to facilitate the attainment of a common education, and every thing which is accomplished by a Written Language; or to do for Literature what the steam engine has done for navigation. By U. C. BURNAP, A. M.

Preface.

Letters are the first principles of a written language. With these are made syllables and words, by the different sounds of which, different ideas are expressed. When a word is written, we recognise its signification, by knowing what sound is at-

tached to it when it is spoken. The labour of learning to read consists in rendering familiar the sounds which are attached to a certain combination of letters and syllables.

The amount of labour required to read any language, by one who can already speak it, depends upon the simplicity and the perfection of the alphabet. *To be perfect, the letters of an alphabet must express every simple sound in the language; and no two letters must ever express the same sound.* When a language is so constructed that its sounds are very numerous, it may be easier to give one character two or three different sounds, distinguished by some simple mark, than to multiply characters; but no adequate reason can be given for ever having two characters used to express the same sound.

The English alphabet is deplorably imperfect. Several sounds, very common in the language, are not expressed by any character; and several characters are often used to express the same sound.

Nothing in the alphabet, as the letters are pronounced, would indicate the sound of *th*, *sh*, *tch*, *h*, as an aspirate, *g*, as in *go*, *w*, as in *wind*, or *y*, as in *you*. By learning all the consonants the child is not prepared to form any of these sounds. On the other hand, several letters are used to express the same sound; as *g* and *j*, *c* and *s*, *s* and *z*, *f* and *v*, *ph* and *f*, *c*, *q*, and *k*, *w* and *ua*. In the vowels there is much ambiguity. Several have the same sound in different places. As, *sir*, *her*, *bur*, the *i*, *e*, and *u*, having the same sound in these words.

These deficiencies and redundancies, together with double and silent letters, render the orthography of the English language perplexing beyond description. No general rules can be formed for spelling. The art of spelling can be acquired only from the memory of every word. When a child has learned to spell one half of the words, he has obtained no rules to assist him in the other half. In no case is the pronunciation of a word a sure guide to the spelling; nor is the spelling, when seen, any sure guide to the pronunciation.

Years of labour, perplexity, and discouragement are spent in learning to spell, nor is the art ever obtained to perfection. With regard to literature, we must take a heavy burden on our backs in childhood, and carry it through life, without deriving any benefit from it, during any of our course. We may throw it off now, and never impose it upon our children and our posterity.

The following system is introduced to remedy the evils

which have been mentioned—to supply the *deficiencies* and remove the *redundancies* of our alphabet, so that the letters may be perfectly adapted to the orthography, and the orthography perfectly suited to the pronunciation. By altering the names of some of the letters, adding one, by inversion, and omitting one, and by using some simple distinctive marks, I have rendered the alphabet perfect, without any new characters; so that when the child has learned his letters, he has learned to spell every word in the language, and no one can be at a loss how to spell a word which he can pronounce.

The *simplicity* of the system is what induces me to present it to the public, and to hope that it will eventually prevail, and be a blessing to our country.

The Alphabet.

	Pronounced		Pronounced
A	a	L	el
B	be	M	em
C	she or che	N	en
D	de	O	o
E	e	P	pe
F	ef	R	ar
G	ge as in go	S	es
H	he	T	te
Λ	the, as in thin, or this. It is *v* inverted in all cases.	U	u
		V	ve
		W	we
I	i	X	ex, eks, or egs
J	ja	Y	ye
K	ka	Z	ze, or zhe

Power of the Letters.

The letters of the alphabet are divided into vowels and consonants.

The *vowels* are five, a, e, i, o, u. W and y are not to be used as vowels, or at the end of words, because we have vowels enough without them; and they occasion a perplexing ambiguity.

A has three sounds.

1. a natural, as in *save*.
2. a short, as in *hat*.
3. a sharp, as in *part*.

The sound of broad *a*, as in *hall*, is supplied by short *o*,

which is to be used in all places where *a* has had this sound. The object of this change is, that no two vowels shall ever have the same sound. Other changes will be made in the vowels for the same purpose. I wish to remove all redundancy from the vowels, so that there may be no doubt which one to use for any specified sound.

E has two sounds.

1. e natural, as in *mete*.
2. e short, as in *met*.

I has two sounds.

1. i natural, as in *pine*.
2. i short, as in *pin*.

O has two sounds.

1. o natural, as in *note*.
2. o short, as in *not*.

The sound of oo, or of o in *move* is to be expressed by the third sound of *u*, in order that there may be but one sound of the kind among the vowels.

U has three sounds.

1. u natural, as in *tube*.
2. u short, as in *tub*.
3. u sharp, as in *bush*; or the sound of *oo*.

With regard to this letter, it should be observed, that in its common pronunciation, it is not strictly a vowel, being sounded as if it were spelt *yu*. When it begins a word with its *natural* sound, it retains this consonant sound; in all other cases it has only a vowel sound. In such words as *unit*, *universal*, it is sounded as if it were preceded by *y*.

It is common to make more minute divisions of the vowels, than is here retained; but careful examination will show that here are all the distinct vowel sounds in the language. Sounds may vary in quantity, or the same sound may be protracted more in some words than it is in others, without any real distinction in the nature of the sound. The short o is protracted more in the word *nor*, than in the word *not;* but there is no distinction in the simple sound. The sharp *u* is sounded longer in some words than in others, while the organs retain the same position. It would be unnecessary to designate these distinctions, because they are governed by the consonants, with which the vowels are connected. For instance, the scholar will necessarily dwell longer on the sound of *o* in *nor*, than in *not*. The same word is varied a little in pronunciation, by the importance which is attached to it, so that it would

be impossible to mark all the varieties of pronunciation, in relation to the *quantity* of sound; and the attempt would cause perplexity, rather than promote harmony.

Thus, there are, in our language, twelve distinct vowel sounds, requiring so many characters to distinguish them. To prevent the necessity of new characters, I use the following methods of distinction.

Let the simple letter *a* be *a* natural in all places; *a* with one dot over it the second, or short *a*, and *a* with two dots the third, or sharp *a*.

Let simple *e* be *e* natural; *e* with one dot, be short *e*.

Let *i* with one dot, as usual, be *i* natural; *i* with two dots, *i* short.

Let simple *o* be *o* natural; *o* with one dot, short *o*.

Let simple *u* be *u* natural; *u* with one dot over it, short *u*, and *u* with two dots, sharp *u*.

In this way, the vowels would be perfectly distinct, so that there would be no hesitation about their sound. As the vowels are now used, great perplexity arises from sounding one like another, in many cases. I propose to avoid all this, by always using the vowel, the sound of which I want. One vowel is never to be sounded like another. We have *twelve* distinct vowel sounds in our language, and by applying them according to their definitions all perplexity may be avoided.

The *diphthongs oi* and *ou* are strictly vowel sounds, being the short sounds of those letters respectively; so that no new character, or mark of distinction is requisite for them. They are to be used in all cases, where *ow*, and *oy* have expressed their sound.

By these definitions and explanations we have a *perfect vowel system.*

Consonants.

B has one sound as in *bo*, *rob*.

C has two sounds,—1. of *sh*, 2. of *ch*, as in *show*, *charm*. In spelling words where it sounds like *sh*, it may be called *she*. In its other use, it may be called *che*. Its second sound is distinguished by one dot over it. I have altered this letter, because it is not needed for its present use. S and k may supply its place where it has sounded like those letters; and because we had no such sounds in our alphabet as are now given to it. By the alteration, two deficiencies are supplied, and two redundancies are removed.

D has one sound, as in *did*.

F has one sound, as in *fo*. It is never sounded like v, nor is its sound ever supplied by *ph*.

G has one sound, as in *go*, *log*. It is never sounded like j. I have altered the name of this letter, because we had not its sound in the alphabet. The alteration is a remedy for a redundancy and a deficiency.

H has one sound, as in *ho*, *hand*. The name of this letter is altered to have it express the proper sound of the letter, and to have its pronunciation easy.

Λ has two sounds. 1. *th* in thin. 2. *th* in this. The second sound is distinguished by one dot over it. This letter is added because nothing like its sound was in the alphabet. To prevent the necessity of new type, I have inverted the letter *v*. It is to be *written* like capital A without the cross, and the small letter in the same fashion. To make writing more legible, the small letter is to be made a little higher than the common small letters.

J has one sound, as in *just*. It is to be used in all places, where g has sounded like j.

K has one sound, as in *kite*. It is to be used in all places where c and ch have sounded like k; and also where q has been used.

L has one sound, as in *lo*.

M has one sound, as in *man*.

N has one sound, as in *no*.

P has one sound, as in *pin*.

The place of q is supplied in all cases by k, and q is cast out as redundant.

R has one sound, as in *ro*, *or*.

S has one sound, as in *so*, and is never to be sounded like z.

T has one sound, as in *tin*, *at*.

V has one sound, as in *vine*, *ov*.

W has one sound, as in *wind*, *wo*.

I have altered the name of this letter, to have it spoken more easily, and to have it express the sound for which it is used. It is not to be used as a vowel in any case.

X has two sounds. 1. of *ks*. 2. of *gz*. The second sound is denoted by a dot over it. This letter is a redundancy in the alphabet, and might be omitted. I retain it, because in all cases where it is used, it supplies the place of two letters, and being uniformly used for those letters it cannot cause any perplexity.

Y has one sound, as in *you, yonder.*

I have altered the name of this letter, to have it express the sound for which it is used.

Z has two sounds. 1. as in *zeal.* 2. as in *azure*, or as zh. The second sound is denoted by one dot over it. Z is to be used in all places where *s* has sounded like z.

Thus we have twenty-three consonant sounds, and twenty-one consonants. X is redundant, so that we must express twenty-three sounds by twenty consonants. C, ʌ, and z, have two sounds each, so distinguished as to cause no more ambiguity than if we had new characters. In this way an alphabet is rendered perfect, with regard to consonants; and we see that our language has but thirty-five simple sounds, by the combination of which all our words are formed. We have twenty-three consonants, and twelve vowels. At the first view, the sounds of ng, nk, and nx may appear to be different from any thing in the alphabet; but on closer examination, they are found to be compound sounds, the result of the quick pronunciation of the two letters. Each of these sounds varies in different places, so that a character could not be perfectly adapted to it; and by continuing the two letters we get the sound with less perplexity than we could by any new characters.

General Rules for Spelling according to the new Orthography.

1. No silent letters are to be used; every letter has its full, natural sound.*

2. No double letters are to be used; as ff, ss, ll; and no repetition of letters, as immortal, borrow. One of these letters produces the same sound in pronunciation as both.

3. In words where the termination ed is not sounded as a distinct syllable, the *d* only is to be written.

The most general rule on this subject is, when a word ending in *ed* is used as an adjective, the sound of ed is to be full. In all other cases it must be shortened, when the pronunciation will admit. Such words as *wasted, feasted,* will not admit of contraction.

4. The e final is to be omitted, except in words of one syllable, containing but one consonant; as me, ye, *se.*

5. In no case should two letters be employed when one will express the sound.

The imperfect syllables, such as the last of the following words, should not have a vowel.

* N, before g, k, and x, has not a full sound, but is slightly pronounced.

Heaven, given, person, able, eagle.

They should be written thus;

Heavn, givn, persn, abl, eagl.

The sum of all these rules is,—Let every word be spelt in the easiest manner possible, keeping in view the true pronunciation of every syllable, and the sounds of all the letters. To change any word to the new orthography, nothing more is necessary than to ascertain its true pronunciation, and then make the sounds in the most simple manner.

To the Instructer.

What has already been said, is intended merely as an explanation of the system, to prepare one to read, write, and teach the new orthography. I shall now commence again, with the elements of the language, according to the new orthography, as an introduction to a spelling book designed for common instruction.

Ae ïndepèndènt Amèrïkàn Spèlling Bük; òr ae Oraògrafe òv ae Englïc Làngwaj Simplefid ànd àdàptèd tü ae jènüral stàndürd òv pronünsïacün. Intèndèd gratele tü fasïlïtat ae àtanmènt òv a kòmün èjukacün ànd èvre aïng whïc ïz àkòmplïced bi a rïtn làngwaj; or, tü dü fòr Lïtèratur whòt ae stem ènjin hàz dün fòr Nàvïgacün. Bi U. C. Burnàp, M. A.

Alphabet.

A	a	a	M	m	em
B	b	bee	N	n	en
C	c	ce	O	o	o
D	d	de	P	p	pe
E	e	e	R	r	ar
F	f	ef	S	s	es
G	g	ge	T	t	te
H	h	he	U	u	u
Λ	ʌ	ʌe	V	v	ve
I	i	i	W	w	we
J	j	ja	X	x	ex
K	k	ka	Y	y	ye
L	l	el	Z	z	ze

Lètürs àr dïvidèd ïntü vouèlz ànd kònsonànts. A vouèl kàn be sòündèd wïthout ʌe hèlp òv ànüʌèr lètür. A kònsonànt rekwirz ʌe hèlp òv a vouèl ïn pronünsïacün. Whèn ʌe còrt soundz òv *ou* and oi kùm tügèthür, ʌa är kòld dïpʌònx.

Aar är fiv vouèlz, a, e, i, o, u.

A hàz ᴀre soundz.

1. nätûràl, àz ïn *slat*.
2. còrt, àz in *hàt*. Non bi wùn dot.
3. cärp, àz ïn *pärt*. Non bi tü dòts.

E hàz tü soundz.

1. nàcùràl, àz ïn *me*.
2. còrt, àz in *lèt*. Non bi wùn dòt.

I hàz tü soundz.

1. nàcùràl, àz ïn *bi*.
2. còrt, àz ïn *pïn*. Non bi tü dòts.

O hàz tü soundz.

1. nàcùràl, àz ïn *bo*.
2. còrt, àz ïn *nòt nôr*. Non by wùn dòt.

U hàz ᴀre soundz.

1. nàcùràl, àz ïn *bu*.
2. còrt, àz ïn *bût*. Non bi wùn dòt.
3. cärp, àz ïn *rüt, müv*. Non bi tü dòts.

In fòrmïng wùrdz, ᴀar mùst be àz mène sïlablz àz ᴀar är vouèlz, èxcèpt whèn ᴀe vouèlz är uzd àz dïpᴀônx.

Ae Kònsonànts.

Ae kònsonànts hàv bût wùn sound eċ, èxèpt ᴀe fòr fòloïng, c, ᴀ, x, ànd z.

C hàz tü soundz. 1. àz ïn *cin* (shine). 2. àz ïn *ċùrn* (churn). Ae sèkùnd sound ïz dïstïngwïcd by wùn dòt ovùr ᴀe ċ.

A hàz tü soundz. 1. àz ïn *aïn*. 2. àz ïn *ae*. Ae sèkùnd sound ïz non bi wùn dòt, à.

X hàz tü soundz. 1. àz *ks*. 2. àz *gs*. Ae sèkùnd sound ïz non bi wùn dòt, ẋ.

Z hàz tü soundz. 1. àz ïn zel. 2. àz ïn à^{z}ur. Ae sèkùnd sound ïz non bi wùn dòt, ż.

Òl ᴀe kònsonànts hàv ᴀar fül sound, whaṙèvùr ᴀa òkùr, èxèpt n, whïċ, befor g, k, ànd x, ïz slitle sounded.

Ae fòloïng lètùrz ma be uzd fòr wùrdz, fòr ᴀe sak òv èxpedïcùn ïn rïtïng, wïȧout òkażùnïng ène pèrplèxïte. A, i, ànd o, är nèsèsarïle uzd fòr wùrdz, bekòz ᴀa kàn nòt be spèlt, èxèpt by ᴀèmsèlvz. B ma be uzd fòr be, c fòr ce, h fòr he, ᴀ fòr ᴀe, r fòr ar, u fòr yu, w fòr we, y fòr ye. Az, I àm, ᴀou ärt, h ïz ; w r, y òr u r, ᴀa r. I ma b, ᴀou maèst b, h or c ma b.

Ae lètùr x ïz a kòntràkcùn òv ks, ànd gs, ànd cùd b uzd ïn òl kasèz ïnstèd òv ᴀoz lèturz.

To the Public.

That the foregoing system of orthography will be adopted in our country without opposition, is what no rational man could expect. Almost every valuable improvement must, at first, struggle with ridicule and opposition. In the way of so great a change, there are many and formidable obstacles; but none of them are *insurmountable.* This is an age for improvement, and our country is favourably situated for accomplishing such an object as is here proposed.

Holding myself in readiness to answer any objections which may be presented, I shall not refer to any, at this time, but merely mention some of the advantages which would result from the adoption of this system.

In the first place, the prevalence of this system would render the spelling and the pronunciation of our language uniform and permanent.

A partial change in our orthography, or the alteration of only a few words, would not be desirable; because it would open the way for frequent and perplexing alterations, and prevent anything like permanent uniformity. This system contemplates such a change, as will leave room for no farther changes. It renders our orthography perfectly simple—it spells every word in the most simple manner, according to the most approved standard of pronunciation.

2. The labour of educating our children is greatly diminished; so that, with the same advantages, they may rise to a higher state of improvement. When the child has learned the alphabet, he has learned to spell every word in the language. He finds no ambiguity. He has but one method to form any syllable. When the language is printed with its proper marks, he sees at once how every word is pronounced. Thus, the labour of months may become the labour of so many weeks, in the elements of education.

3. The mental discipline would be far more valuable. To strengthen the intellectual powers they must be laboriously employed; but they should not be applied to objects which can never be accomplished. Solving a difficult question in arithmetick, strengthens and invigorates the mind; but labour upon one which cannot be solved, discourages, and unfits the mind for continued action. Our present method of spelling is a continual perplexity. The memory is assisted by no general rules. Every word must be learned by itself. Probably there is not a man in the United States, who can readily spell every word in our language. If his memory fails in a single instance, he can appeal to no rule for assistance. Putting such a task upon a child, discourages him, and rather unfits

Tü ae Publik.

Aât ae forgoïng sïstem òv òrʌògrafe wïl be ädoptèd ïn our kùntre wïʌout òpozïcùn, ïz whòt no racùnal màn kùd èxpèkt. Òlmost èvre valuable ïmprüvmènt must, ät fürst, strùgl wïʌ rïdïkul änd òpozïcùn. In ae wa òv so grate a èanj, ʌar är mène änd förmïdabl òbstakls ; but nùn òv ae̋m är ïnsurmountable. Aïs ïz àn aj for ïmprüvment, änd our kùntre ïs favùrable sïtuated för akòmplïcing süċ àn òbèkt äz ïs her propozd.

Holdïng misèlf ïn rèdïnès tü ànsèr ène òbjèkcùnz whïċ ma be prezèntèd, I cäl nòt refer tù ène ät aïs tim ; bùt merle mèncùn sùm òv ae ädväntajez whïċ wüd rezùlt fròm ae ädòpcùn òv aïs sïstèm.

In ae fürst plas, ae prèvalèns òv aïs sïstem wùd rèndùr ae spèlïng änd ae pronùnsïacùn òv our làngwaj unïform änd pèrmanènt.

A pärcäl èhanj ïn our òrʌògrafe, òr ae òltèracùn òv onle a fu würdz, wùd nòt be desirabl ; bekòz ït wüd opn ae wa för frekwènt änd pèrplèxing òltèracùnz, änd prevènt ène aïng lik pèrmanènt unïförmïte. Aïs sïstèm kòntèmplates süċ a èanj äz wïl lev rüm för no fürʌùr èanjèz. It rèndùrz our òrʌògrafe pèrfèktle sïmpl—ït spèlz èvre würd ïn ae most sïmpl mànùr, äkòrdïng tü ae most äprüvd ständärd òv pronùnsïacùn.

2. Ae labùr òv èjukatïng our èïldrèn ïz gratle dimïnïcd ; so ʌat, wïʌ ae sam ädvàntajèz, ʌa ma riz tù a hièr stat òv ïmprüvmènt. Whèn ae èild hàz lèrnd ae älfabèt, he hàz lèrnd tü spèl èvre würd ïn ae làngwaj. He findz nò àmbïguïte. He hàz bùt wùn mèʌod tü förm ène sïlabl. Whèn ae làngwaj ïz prïntèd wïʌ ïts pròper märx, he sez ät wùns hou èvre würd ïz pronounsd. Àùs, ae labùr òv mùnʌs ma bekùm ae labùr òv so mène wex, in ae èlemènts òv èjukacùn.

3. Ae mèntàl dïsïplïn wüd be fär mor vàluabl. Tü strèngʌn ae ïntèlèkèual pourz, ʌa mùst be laborïùsle èmploïd ; bùt ʌa cüd nòt be äplïd tü òbjèkts whïċ kàn nèvùr be äkòmplïcd. Sòlvïng a dïfïkùlt kwèsèùn ïn arïʌmètïk strèngʌnz änd ïnvïgorats ae mïnd ; bùt labùr ùpon wùn whïċ kàn nèvùr be sòlvd, dïskùrajèz änd ùnfïts ae mïnd för kontïnud äkcùn. Our prèzènt mèʌùd òv spèlïng ïz a kòntïnual pèrplèxïte. Ae mèmore ïz äsïstèd bi no jènùràl rulz. Èvre würd mùst be lèrnd bi ïtsèlf. Pròbable, ʌar ïz nòt a màn ïn ae United Stats, hù kàn rèdïle spèl èvre würd ïn our làngwaj. If hïz mèmore falz ïn a sïngl ïnstàns, he kàn äpel tü no rul för äsïstàns. Pütïng süċ a täsk ùpòn a èild, dïskùrajèz hïm, änd rʌʌur ùnfïts hïz

his mind for vigorous exertion, in other branches; besides occupying years of time, which might be devoted to higher attainments.

4. The new orthography shortens the language about one sixth; that is, five pages in the new will contain about as much as six pages in the old. Thus, books of the same real value may be obtained at a less price, and every thing which is accomplished by a written language may be done with less labour.

5. The ease with which this system can be acquired is encouraging, with regard to its general prevalence. A few hours' attention will enable one who has already learned to read, to understand the new orthography. And a little practice will enable him to write it readily.

6. It is not an object, the value of which is doubtful, when accomplished. Every person, of much reflection, must see that immense good must result from it, to all the future generations of our country. Like the revolution which made this a free and independent nation, it may occasion some inconvenience for a few years, but the blessings will extend to all posterity. The permanency of all our valuable civil and religious institutions depends upon the universal diffusion of knowledge; and the new orthography may raise the standard of common education, and cause its blessings to become more widely diffused.

A vast proportion of the reading of our country is journals and periodical publications, the orthography of which can be altered whenever required; and new editions of permanently valuable works may be issued in this form when they are wanted.

A spelling book, and other school books may soon be expected, adapted to the new system, that the rising generation may soon be relieved from the burden which we have long borne.

The editor of a journal who shall first send out his publication in this form, will be named with gratitude by posterity, as the courageous promoter of a most important revolution; and the state which first adopts it, will long be honored for its patriotism.

With the hope that this system may be a rich blessing to our country, in relation to all its literary, political, and religious interests, I submit it to the examination and decision of the AMERICAN PEOPLE.

U. C. BURNAP.

mind for vigurus exurcun in uaur branceez; besidz okupiing yerz ov tim, whic mit be devoted tu hier atanments.

4. Ae nu oraografe cortnz ae langwaj about wun sixa; aat iz, fiv pajez in ae nu wil kontan about az muc az six pajez in ae old. Aus, bux ov ae sam real valu ma be obtand at a les pris, and evre aing whic iz akomplicd bi a ritn langwaj ma be dun wia les labur.

5. Ae ez with whic ais sistem kan be akwird iz enkurajing, with regard tu its jenural prevalens. A fu ourz atencun wil enabl wun hu haz olrede lernd tu red, tu understand ae nu oraografe, and a litl praktis wil enabl him tu rit it redile.

6. It iz not an objekt, ae valu ov whic iz doutful, when akomplicd. Evre persn ov muc reflekcun must se aat imens gud must rezult from it, tu ol ae fucur jenuracunz ov our kuntre. Lik ae revolucun, whic mad ais a fre and independent nacun, it ma okazun sum inkonvenyens for a fu yerz, but ae blesinx wil extend tu ol posterite. Ae permanence ov ol our valuabl sivil and relijus institucunz dependz upon ae universal difuzun ov nolej, and ae nu oraografe ma raz ae standard ov komun ejukacion, and koz its blesinz tu bekum mor widle difuzd.

A vast proporcun ov ae reading ov our kuntre iz jurnalz and periodikal publikacunz, ae oraografe ov whic kan be olterd whenevur rekwird; and nu edicunz ov permanentle valuabl wurx ma be icud in ais form, when a ar wonted.

A speling buk, and uaur skul bux ma sun be expektd, adaptd tu ae nu sistem, aat ae rizing jenuracun ma sun be relevd from ae burdn whic we hav long born.

Ae editur ov a jurnal, hu cal furst send out hiz publikacun in ais form, wil be namd wia gratitud bi posterite, az ae kurajus promotur ov a most important revolucun; and ae stat whic furst adopts it wil long be honurd for its patriotism.

Wia ae hop aat ais sistem ma be a ric blesing tu our kuntre in relacun tu ol its liturare, politikal, and relijus interests, I submit it tu ae examinacun and desizun ov ae Amerikan pepl.

U. C. BURNAP.

Art. V.—*Elementary Instruction in Latin.*

[The Latin language forms at present an extensive and very important branch of education. The proportion of time and attention assigned to it, and the methods adopted in teaching it, must always be matters of interest to parents and teachers.

In the successive numbers of this Journal we have accordingly endeavoured to attract the attention of our readers to the subject of modes of teaching in the department of languages. The course of investigation on this topic, has led us to state what we doubt is too little known, even among well-informed teachers, that the advantages supposed to result from established methods, have been questioned or denied by not a few of the most profound and learned men in various countries, who have made this subject a matter of close observation, and who have been induced to devise and offer methods more simple and rational. Among these eminent authorities on whatever pertains to the culture of the mind, Milton and Locke, Condillac and Dumarsais, have been repeatedly referred to in our pages; and copious extracts from their writings have been introduced, embodying the substance of their views on this interesting question. In pursuance of the same subject, we would now offer to our readers a translation of Dumarsais' 'Exposition of a rational method for learning the Latin language,' and as introductory to that treatise, the following explanations of its character and objects, as given by D'Alembert in his eulogy of its author.]

'The method of Dumarsais divides his subject into two parts, —usage and reason. To know a language is to understand its words; and this knowledge belongs properly to the memory, —to that faculty which is first to develop itself in childhood, which is even more lively at that age than at any other, and which may be called the intellect of infancy. It is this faculty, then, which we ought to exercise at first, and which ought even to be exercised alone. We could then teach children without fatiguing them, presenting, in various ways, those Latin words which are most in use. We should then offer them a Latin author to read, arranged according to the French construction, and without inversion. We should supply, moreover, in the text, the words 'understood' by the author, and place under every Latin word the corresponding term in

French. Opposite to a page so arranged, and with a view of facilitating the understanding of it, we should place the text to the author, as it is, and, by the side of the literal French, a translation accommodated to the genius of our own language. This manner of teaching Latin to children, is an exact imitation of the mode in which living languages are rendered familiar, which practice alone, teaches much sooner than all methods. It is, besides, in exact conformity with the order of nature. Language is first established, and grammar comes as a sequel.

As soon as the memory of children becomes supplied with words, as first their understanding enlarges, and the practice of translating brings them to perceive the varieties in the terminations of Latin words, and in construction, and the objects of these variations, they are taught, by degrees, declension, conjugation, and the first rules of syntax; and the application of these is shown them in the very authors they are translating: thus they are gradually, and, as it were, by a sort of instinct, prepared to receive the principles of systematic grammar, which is properly nothing else than a true logic,—but a logic which may be put perfectly at the command of children. They are then taught the mechanism of instruction, by being required to trace the anatomy, as it were, of every phrase, and by receiving a correct idea of every constituent part of a sentence.'

[The introductory paragraphs in Dumarsais' Exposition being merely a statement, in his own words, of what we have just extracted from D'Alembert, we shall, for the present, omit,—with the exception of the following, which gives a very clear, though quaintly expressed, view of his whole system.]

'This method has two parts, *rote* and *reason*. I mean to say, that in the second part, is contained the *reason* for what in the first, was learned only by *rote*.

'PART I. ROTE. To understand the Latin language we must learn,

1. The signification of Latin words.

2. Latin inversion, or the transposition of such words as are not placed in the natural order which they follow in French.

3. Ellipses, that is to say, forms of expression in which there are words understood.

4. Lastly, Latinisms, or forms of speech peculiar to the Latin language.

Of the Signification of Words.

With regard to the signification of words, I know not why the early years of life are not employed in learning these; for after all, to know a language is to understand its words. Children have memory; and the study does not demand application: it is thus I think that we ought to begin.

I would begin with teaching children the Latin words which are the names of sensible objects with which their minds are most frequently brought in contact, *fire*, *bread*, &c.

Children take delight in learning these words, and in being asked to apply them. Hence results two great advantages: first, the knowledge of Latin words; second, a stock of ideas and intelligence.

This stock of ideas ought to be one of the principal objects of education. It is with this view that I have composed a little treatise intelligible to children, to give them ideas of nature, of the arts and the sciences; and I hope to render the reading of it more useful and more entertaining by the aid of illustrative figures.

I am well aware that this design has been executed in some measure by Pomey, in his *Indiculus Universalis*. His book, however, contains nothing but words, and these very often unsuitable. Before him, Commene, the author of *Janua Linguarum*, had a similar idea, but more enlarged. In his book, however, there are many faults both as regards words and things.

The words of my treatise I caused to be copied by children who are old enough to learn to write. Writing is a capital point, which ought never to be neglected. The great masters in education, have always advised the requiring of much writing. For this reason, I have my pupils copy daily from a vocabulary, in which the Latin verbs are arranged in four columns in alphabetical order, thus,

Amare, amo, amavi, amatum *: to love.*

By this exercise they learned the preterites and supines. The rules for forming these parts of the verb have always seemed to me very objectionable and quite useless. It is practice alone which teaches these. I appeal to all men of learning who have not become habituated to the business of teaching, whether most of them have not forgot entirely the rules of formation, and yet can recollect perfectly the prete-

rites and supines themselves. Use has graven them on the mind. I have observed, too, that it not unfrequently takes more time to learn some of the rules, than it does to commit to memory the whole class of words which the rules are meant to explain.

I hear my pupils read, morning and evening, what they have copied from the vocabulary I have mentioned; and, in a short time, all the verbs are acquired with their significations. Here is a considerable advance; for as no proposition can be made without a verb expressed or understood, so the pupils soon arrive at such a point of progress, that they find few or no Latin phrases in which they do not understand the verb,—that is to say, the principal word.

All these words ought to be impressed on the memory by a repetition skilfully managed. A few words should be learned every day, according to the capacity of the pupil; and when in the repetition of them the teacher perceives that the pupil hesitates on a word required, care should be taken to anticipate the memory that it be not strained.* It is nothing but repeated use which can retrace the words on the mind, and prevent dislike, which is the greatest of all obstacles; and which is ordinarily caused by overstrained application.

In teaching Latin, we should never omit to make our pupils take notice of all *radical* words as they occur. Etymology serves to render the mind familiar with the force of words, and aids in retaining them in the memory, by the connexion established between primitive and derivative words. This is a useful assistance to the acquisition of habits of accuracy in the choice of expression.

I make use for this purpose of the little dictionary of M. Danet, in which the words are arranged by roots. This work is but little known, though excellently adapted to impress words on the memory. For example, at *amo* I find

Am*or*—oris	Amica
Amat*or*—oris	Amicè
Amatoriè	Amicitia
Amatrix	Amabilis
Amicus	Amabiliter, &c.

* We cannot pass over this humane and truly philosophic suggestion without submitting the inquiry whether in some instances education is not a process of habitual 'straining,' rather than of natural and salutary exertion.—Tr.

Of Inversion.

Latin inversion is what causes most trouble to young learners. Accustomed to express their own thoughts, and to hear those of others expressed, in the order of their vernacular tongue, (which alone is natural to them,) when this order is inverted or widely varied, they cannot conceive the meaning of a phrase, even though they understand each of its words.

The *arrangement* of words in French, for example, shows in what sense they are taken, whereas in Latin it is the *terminations* of words that determine the relation in which the word is to be considered.

Le Roi aime le peuple makes one sense; but change the place of the words, and say *Le peuple aime le roi*, and you have a different meaning; whilst in Latin it is a matter of indifference whether you place the word corresponding to *le peuple* or that corresponding to *le roi* before or after the verb; but the termination will be different, and hence will be understood who *loves* or who is *loved*. For this reason, French words are not declined; that is to say, have always the same termination; their place to the eye and the prepositions preceding them serve to regulate their sense. In Latin, words change their terminations, in order to mark the different relations under which the same word may be considered, which causes Latin words to be found very often at a great distance from their natural connexion in regimen.

In the first books which I use, the words are arranged in the natural order, and under every Latin word is the corresponding French one. The French is Latinized. By this I mean that the French word explains the Latin word in its *literal* signification, as exactly as possible.

There is no reason to fear that this method will cause the learner to acquire bad French.

1st. The more exact our habits of mind, the better we write and speak. Nothing is better suited to impart exactness and accuracy of thought, than exercises in literal translation, because these impel the learner to precision and propriety of expression, and to an exactitude which hinders the mind from wandering off to thoughts which are foreign to immediate objects.

2. Literal translation causes the difference of the two languages to be felt. The more remote the Latin turn of expression is from the French, the less reason is there to fear that it will be imitated in discourse.

3. Besides, the French word is not pronounced till after the Latin. Thus the incorrect French idiom being interrupted, and being attached to the Latin, it is impossible that it should be transferred to ordinary conversation.

4. Finally, translation in general is made for one of two purposes: first, with a view to communicate the meaning of an author to persons ignorant of the original. A literal translation of the words of the author would, in such circumstances, be ridiculous. The translator ought to speak his own language, and not that of his author; because he speaks only to people of his own nation. Thus, he ought to render expressions peculiar to the original by expressions peculiar to his own language. In one word, he ought to speak as the author would have spoken if he had written in the language of the translator.

2. But when we read so as to understand, for ourselves, the language of the author, it is evident we shall not gain our end but by learning the special signification of the words, and the particular turns of expression in the original. The easiest, in fact the only way of arriving at this point, is literal translation.

[What relates to ellipsis and idiom we shall reserve for another number, as the chapters on these subjects are of considerable length. It may not be inappropriate here to mention that the method of Dumarsais has been very ingeniously and successfully adapted to the study of the French language in the elementary books prepared by Professor Bolmar of the Franklin High School, in Philadelphia.*

Since we commenced our present article we have received and examined with much satisfaction a copy of a book entitled 'The New Latin Reader, containing the Latin Text, for the purpose of Recitation; accompanied with a Key, containing the Text, a literal and a free Translation, arranged in such a manner as to point out the difference between the Latin and English idioms. For the use of beginners in the study of the Latin language. By S. C. Walker, Philadelphia. Boston. Richardson & Lord. 1829. 12mo. pp. 194.†

* See Journal of Education, vol. III. p. 214.
† See Notice in this number.

Art. V.—*Principles of Education.*

[A correspondent has favoured us with her views on female education, and with a view to enliven the form of communication, has thrown them into the following dialogue. The garb of fancy in which they are presented, will not, we trust, diminish their interest or lessen their practical utility.]

I send a few selections from Lord Bacon's account of the Bensalem Institution,* with part of a conversation on the state of arts and literature in that country, together with some of their principles of education, extracted from a work not published in this country. I know not whether they come within the prescribed limits of your Journal.

The conversation is carried on between a stranger who had been shipwrecked on their coast, and resuscitated from a drowning state; and several of the natives, who are represented as possessing every accomplishment of learning, wit, and grace, that ever adorned human beings.

Stranger. Will you tell me by what means your sex as well as ours, throughout this island, have become generally well informed? for I have found those of every age and profession not only fluent in conversation on all ordinary subjects, but well acquainted with those of difficult attainment in science and arts; yet your children are much abroad, and seem to devote little time to labour and study.

Lady. It is true they bestow little *labour* on study; but you greatly mistake the *time!* we are always studying; at least, always learning. Of books, indeed we make little comparative use while children are quite young; but from early infancy they are required to *observe* and attend to whatever passes around them; and as capacity increases, every thing is opened and explained. On this faculty of observation we ground almost every thing; memory, comparison, consequent reasoning and abstraction. It is not only obvious that little proficiency can be made without it, but that it is the order pointed out by nature. The best foundation is laid for active useful education in those active sports and hazardous enterprises to which children are so naturally prone. They learn voluntarily to observe and examine a variety of objects and occurrences,

* See the Novum Atalantis.

as sources, facilities or impediments to their varied enterprises. We are cautious not to diminish these advantages. The mind can only be gradually led from the contemplation of these material things to investigate the principles of the same in more abstract science. By acquaintance with the things, the query is raised *how* they came, and the mind slides rather imperceptibly into the investigation ; and when curiosity is excited, the impulse is sufficiently strong without the addition of emulation. The elements of philosophy and geometry are in this manner understood, (not merely learned,) before a child can read.

Stranger. But have you any secret charm by which you are able to compel the observant attention of children so naturally inclined to versatility.

Lady. We have this charming requisition that they are not to be present at any discourse, entertainment, or exhibition, but such as they must observe and give some account of; and in all lecturing and catechetical instruction we are attentive to point any thing calculated to amuse or interest the young mind, that we may make use of all that buoyancy or vivacity of spirit so predominant in young animals ; but which the course of chaining a child to a school bench must suppress by violence, or turn to vicious activity. If, for instance, the attention of a child be arrested by a curious mineral, flower, or insect, we would place a microscope before it, and display its parts, explain its properties, its mode of existence, arms of defence, and the several changes to which it may be subject, &c. pursuing the same course in making him acquainted with any of the lovely works of God, taking especial care to remember their loveliness. Parents seem to forget how greatly the feelings of children are influenced by the manner of treating a subject, or they would never threaten sending them to school as a punishment, or make them get a great lesson because they had been bad.

Stranger. Pray, Madam, can you teach astronomy by looking at the stars ?

Lady. Not alone by looking at the stars, for much of it is done by making rings, and drawing pictures on the floor. This applies to the geometrical or geographical part, and thus we explain or illustrate the mathematical terms belonging to the science. Children by early practice become very expert in drawing these diagrams, and take great pleasure in being able to assist any child younger than themselves. Perhaps you are

not apprized how very early children learn to take a sort of complacent pride in doing something useful. By keeping a child at these and such like amusements that are something more than innocent, we prevent his seeking entertainment in mean, low, mischievous pursuits, and cruel sports, to say nothing of the murder of his moral sense by finding pleasure in bloody acts of cruelty. Then, not having studied, at fixed periods, and stated tasks, any methodical science with a high sounding name, he is unconscious of having made any attainment of which he can be vain ; yet his actual knowledge may far exceed what would have been acquired by such study. To be sure these things are not done altogether without books ; but books are introduced just as circumstances, and the inquiries of a child demand them, and those particular parts pointed out connected with the inquiry. The book is continued in use, or not, just as the child is found able or not to profit by it. Here you may see, only good passions are brought into exercise, and the three Gorgons—Vanity, Envy, and Cruelty are shut from this door of entrance into the young heart, and thus, I hope, are several of your wonders satisfied : as how we become so learned without study, and how so accomplished without seeming vain. For you may perceive that acquiring the language of science no faster than its principles are unfolded, we are necessarily unable to prattle on a subject not understood. It is superficial knowledge, without knowing it to be such, that excites vanity. But you understand that our attainments are not gained by going a few years or perhaps months to a boarding school to finish our education. We are taught all our lives, by every person with whom we converse, at our work, at our meals, at our amusements, in walking, riding, sailing ; not, certainly, by set lecture, but it is a thing perfectly in course for each one freely to impart of his store, and any one expects his mistakes to be rectified by another better acquainted with a subject. We practice agreeably to the direction of the prophet for instructing in the divine law. 'Ye shall teach these things diligently to your children, when ye lie down and when ye rise up, when sitting in the house or walking by the way.' Your philosophers have suggested many useful hints for correcting and improving the mind, but do not commence sufficiently early ; an erroneous bias is acquired before any attention is paid to the subject. Indeed your wise men seem quite inattentive to elementary instruction ; whereas, with us it is considered of primary importance how the opening of intellect is conducted.

If a child be properly taught how to instruct himself, at the age of twelve or fourteen, he will be able to do without a tutor. To hear a child recite lessons is a trifling part of the required instruction of early life; such lessons are at best soon forgotten; yet though forgotten, they would not be useless if the powers of mind had been brought into exercise in the acquisition; but where the memory has been merely stored with words, when they are lost, all is lost. Excellence of memory seems to consist in the power of forming with facility happy, durable associations; how necessary then that one be acquainted with a sufficient number of *things* themselves, or distinct simple ideas, before he can join words by association which shall be permanently advantageous! Not possessing these, prerequisite propositions must be confined in the mind by associations so preposterous that their retention, if practicable, would be productive of injury rather than benefit. These primary ideas appear to me to constitute those powers of recollection, which metaphysicians tell us are so valuable, and so distinct from what is vulgarly called a great memory.

Stranger. At least, Madam, your people must make great use of books in the various languages you speak.

Lady. We do,—yet perhaps less than you would imagine. It is for the acquisition of language that our children now attend school; yet that is not for direct instruction, but for conversation; our schools being so ordered that but one language is spoken or taught in one house. Of course a child while there speaks the same language he reads, and all his studies are pursued in the same. If studying French, he would go through a course of French history, biography, and conversations; manners, and customs of common life, and perhaps pursue chemistry in the same. By such course in a year or two he gets competent ideas of their language to judge of their modes of thinking, speaking and writing; or, in other words, some notion of the genius of the people. A child will obtain nearly as much durable information while studying a new language, as if the subjects were pursued in his mother tongue, since the time and repetition requisite for retaining the terms, fix also the ideas. What think you now, Señor, of our study and no study, or system and no system?

Stranger. I think, Madam, I would to God we had a similar method or no method, in my own country, for with us it is found to be an ever to be reiterated task 'to teach the young idea how to shoot;' and when taught, it is an hundred chan-

ces to one that this same young shoot never comes to maturity. But how is this every day mode to be introduced? In the early part of life they are universally, and it seems very properly entrusted to females, who are certainly not exactly prepared to afford instruction in season and out of season, even were they sensible of its utility; but though a large portion of our females have the advantage of what we count good schools, yet they are too little in the habit of observing the connexion of causes with effects, and of reflecting on the minute circumstances and influences that operate in directing the temper, mind, conduct, and character of a child; and can scarce conceive that the habits acquired in childhood can have any abiding influence over the character.

ART. VI.—*The New Latin Reader, containing the Latin Text for the purpose of Recitation, accompanied with a Key, containing the Text, a literal and free Translation, arranged in such a manner as to point out the difference between the Latin and the English Idioms. For the use of Beginners in the Study of the Latin Language. By S. C. Walker*, Philadelphia. Boston. Richardson & Lord. 1829. pp. 194.

THE long struggle, which the natural mode of teaching languages has had to maintain with the artificial or scholastic system, is one of the most curious facts in the history of education. Since the days of Locke and Ascham there have always been men of enlarged and philosophical as well as practical views, who have contended for the propriety of instructing children in Latin and Greek as well as in the foreign modern languages in a manner somewhat analogous to that in which they learn their vernacular tongue; and there has always been a host of instructers and others whose immediate interests or long cherished prejudices have rendered them decidedly hostile to every thing like innovation however agreeable it might be to the dictates of philosophy and common sense. That which reason and philosophy have long recommended in vain to this interested class of persons is now imperatively urged—in a manner forced upon them, by the influence of public opinion. The time, for devoting seven years of youth to the painful drudgery of grammar and lexicon, is now past. Men of liberal

views and well disciplined minds have taken up the business of instruction in obedience to the claims of society ; the ancient doctrines concerning the study of languages have undergone a strict scrutiny and, as a natural consequence, are yielding to more enlightened ones ; the amount of information requisite to a polite education has increased so considerably, that a method of learning languages more compendious than that hitherto practised, has become absolutely necessary ; and we observe that the books required for the purpose appear, and the most approved seminaries instantly avail themselves of their assistance as a matter of course.

This state of things is the natural result of the recent excitement in the public mind on the subject of education, which has served to attract the attention of some of the most gifted minds in the community not only to its general importance but even to its minutest practical details. It is found that too much—a great deal too much of the precious time of the young has hitherto been devoted to the learning of Latin. On inquiring the reason of this waste of time, it is found to arise not from any intrinsic difficulty in the study, but from an unnatural and preposterous mode of instruction which requires the child to learn the philosophy of the language before he is possessed of its facts ; and to commit to memory the whole theory and structure of a very artificially constructed language, before he can speak, write, or translate a sentence of that language.

We think it will be matter of astonishment to the generation which shall succeed us, that so absurd a system could have prevailed so long. It is indeed a curious and surprising fact, that instruction in a language which has ever been considered as forming the basis of a polite education, should have been among the latest to derive aid from the light which the inductive philosophy has long been shedding on every other branch of liberal information. We are happy to learn that the natural and philosophical mode of teaching language—the method which places the *facts* of language before the *theory*, in the order of instruction—the method recommended by Locke, and practised by Du Marsais—is rapidly making its way in this country under the auspices of such able instructers as Professor Bolmar and Mr Walker.

In a former number of this Journal, to which the reader is referred,* we have given a cursory review of the history and

* American Journal of Education, No. 28, (for April, 1828,) p. 215. Re-

general features of this system and a particular account of its application to the French language and the considerable improvements made in it by Professor Bolmar. Mr Walker has applied the system of Du Marsais and Bolmar, in its most improved form, to the Latin language and the able and faithful manner in which he has prepared the elementary work before us, augurs well to the future progress of the system.

The 'New Latin Reader' comprises

1. A well digested series of short and familiar sentences arranged with reference to their syntactical form.
2. The 'Historiæ Sacræ' of De L'Homme.
3. 'Narrationes Selectæ.'

Each of these three parts is first inserted in the volume in the manner described on the title page, viz. the text with a literal and free translation; intended to be used in learning the lesson. In the latter part of the volume the pure text is given for the purpose of recitation. Thus the pupil is furnished with the most efficient aid in order to learn his lesson; but he is required to translate it at recitation, both freely and literally without any thing before him but the Latin text. He has every possible assistance towards learning his lesson; but *he must learn it.*

As it respects the method of instruction proposed in the 'Reader' and the advantages of the new system as applied to the Latin, it is but justice, however, to allow Mr Walker to speak for himself. Concerning the system, in his preface, he says

'The merits which it claims are these.

'1. It gives the pupil an exact knowledge of the *literal meaning* of each root in the original.

'2. By means of the prepositions and auxiliaries, it gives the meaning of each root as modified by *inflexion.*

'3. It gives a translation of *phrases* or *idioms*, by which the true import of the original, and the difference of the idioms are learned with precision.

'4. The Latin words are arranged after the English order in the Key.

'5. The pupil is required to recite from the *pure Latin text*, and is therefore obliged to prepare his lessons with care and diligence, and to compare together the Latin and English arrangements of words.' pp. 3, 4.

view of *Œuvres de Du Marsais, Bolmar's Perrin's Fables*, and *Bolmar's Telemachus.*

The method of instruction he thus describes.

'The pupil begins to translate and to study Latin Grammar at the same time. He is directed to study for each recitation, a small lesson in Grammar, and, by the aid of the Key, to prepare for translation a suitable portion of the Latin text. To assist him in learning to spell the Latin words and to remember their meaning, he is required to transcribe into a small copy book as much of the lesson as possible, writing first a Latin word, then its meaning in English, and so on. The Instructer examines the copy book from time to time to see that it is faithfully executed.

'At recitation, the pupil is examined in the Latin Grammar—then he reads the pure Latin text with attention to pronunciation—then gives a literal translation of each word of the original, in the order of the Key—then gives a translation of the *phrases* and idioms, also prepared from the Key.

'☞ Observe that the pupil always recites from the pure Latin text, and uses the Key only in *prepuring* his lessons.

'After the pupil has in this manner gone through the Grammar and perhaps half way through the Latin Reader, he is to have frequent exercises in the *inflexions* of *nouns*, *adjectives*, and verbs, to be prepared from the Grammar by the aid of a *Dictionary* or *Vocabulary*. Before he has finished the Latin Reader, he will be prepared for exercises in the application of the rules of syntax.'—p. 4.

We regard the method of studying Latin proposed by Mr Walker as very decidedly superior to the prevailing one. It is recommended by philosophy as well as by common sense. It is a mode of instruction calculated to interest the youngest class of learners instead of perplexing and fatiguing them in the manner of the ancient method. It is particularly suited to the purposes of maternal instruction and to the use of those advanced beyond the period of childhood, who may wish to instruct themselves. Lastly, it is admirably calculated for the purposes of monitorial instruction.

We have already so fully borne testimony to the general merits of the system and to the faithful execution of this work in particular, that it is scarcely necessary to add a cordial recommendation of Mr Walker's book, to teachers and parents throughout our country.

Art. VII —*Education in Cuba.*

[The following information regarding the state of education in the island of Cuba, is furnished by one who has enjoyed opportunities of actual observation, and who takes a deep interest in whatever relates to the improvement of instruction. The facts mentioned in the subsequent paragraphs are in themselves important ; but they will be peculiarly gratifying to those of our readers who were not aware that public education was a privilege so valuable or so generally accessible in that quarter of the world, as it seems, from this account, to be.]

The subject of education has, for some time past, been receiving increased attention from the government and the more respectable class of citizens in Cuba. The 'Royal Patriotic Society of the Havana' has for some years exerted a most beneficial influence in affording to the citizens of that metropolis the means of instruction in the liberal sciences ; while the Bishop of Havana and several other learned ecclesiastics have entered most zealously into the cause of popular education. Parish schools have recently been erected in many of the towns and villages in the interior of the island, where reading and writing were formerly rare accomplishments. These schools are usually under the immediate direction of the inferior clergy ; and the solicitude manifested by the parents to avail themselves of the advantages for instruction which they offer, affords a pleasing presage of the intellectual advancement of the rising generation.

The most important institution for public instruction which the island boasts, is undoubtedly that which is styled 'El Real Colegio Seminario de San Carlos,' in Havana.

The College is situated in the rear of the beautiful cathedral where the remains of Columbus are deposited. It is a large quadrangle with a court in the centre, surrounded by open balconies, which are supported by arcades. The professors' rooms and the halls, for lectures and recitations, open into these balconies. The building is of stone, two stories high, and in the massive style of architecture which usually prevails in Spanish cities.

There are seven professors attached to the College ; two of the Latin language, one of Jurisprudence, one of Natural Philosophy, one of Mathematics, and two of Theology.

The Latin Classes contain 130 students.

The Class in Jurisprudence 250.

The Class in Philosophy and the Natural Sciences 210.

The Classes in Mathematics and Theology are comparatively small.

The hours of attendance are from seven o'clock till nine in the morning, and from three till five in the afternoon. Nearly all the scholars reside with their parents or guardians in the city, and the younger classes in Latin are required to prepare the greater part of their exercises at home. In these classes, monitorial instruction is used to a certain extent.

In the higher branches, instruction is communicated principally by lectures, with frequent examination of the students; all of whom take notes of the lectures, and consult the authorities to which they are referred by the lecturer, as well as the text book, which serves as the basis of the lectures. The practice of learning a lesson by rote from the text book, and repeating it to the Professor is unknown in these classes.

Of the whole number of students, only thirtyeight board in the college. Of these, twentyfour are charity scholars, who are nominated by the Bishop, the most munificent patron of the College. The remaining twelve pay two hundred and fifty dollars per annum for their board. The whole number of students receive instruction gratis. So that this College, so admirably suited for instruction in the highest branches of learning taught in the country, is, to all intents and purposes, a free seminary. The humblest citizen of Havana may secure its advantages for his sons.

The public examinations of the students, which take place frequently, are conducted in a manner calculated to keep alive the interest of the citizens in the institution, at the same time that it cannot fail to elicit the best exertions of the students.

A professor issues a small printed pamphlet, announcing that he will, on certain days, generally three or four days in succession, publicly examine a number of the students of his class on certain propositions and principles of the science taught by him, a synopsis of which is contained in the pamphlet.

On the day specified, the large quadrangular court in the centre of the College building is prepared for the reception of company; a band of music is in attendance; the apparatus for philosophical and chemical experiments is brought out, if those sciences are to be treated of; and the balconies and arcades of the College are, at an early hour, crowded with the parents

of students and other friends of the college, and a numerous collection of foreigners and strangers.

In the presence of this brilliant assemblage of nobility, talent, and fashion, the young gentlemen of the College are required to pass an examination in the given science, without any notes of their own ; and if it should be one of the natural sciences, they must themselves perform experiments, and lecture extempore, on the principles which those experiments illustrate. The delivery of speeches, committed to memory, forms no part of the exercises on these occasions.

It is a most auspicious circumstance for the future prosperity of this excellent institution that it has recently been placed under the direction of Don Justo Velez, a gentleman, who is admirably fitted for the station which he occupies, as well by his learning and talents as by his extensive observation of the seminaries of learning in Europe and the United States. To his exalted character and pleasing manners, many of the friends of science in this country, as well as in Cuba, can bear testimony.

Art. VIII.—*A Lesson in Botany.*

In addition to the remarks in the last number of the Journal, we give the following as an example of the method employed by the writer in teaching a class of a dozen girls from eight to twelve years of age.

A lesson is first recited from the Child's Botany, a book, which has few equals in interest or instruction to young scholars. This lesson is short, that the mind may not be confused with too many ideas ; but is required to be thoroughly committed. As the recitation goes on, every scientific term under it is familiarly explained, and additional illustrations are given from the plants with which the class are already acquainted.

A specimen is then taken up, say the scarlet Pimfernel, (Anagallis Arvensis,) and we proceed, this way.—Teacher. How many *stamens* do you find in this flower ?

Pupil. Five.

T. It is therefore of what class ?

P. Of the fifth class, called *Pentandria ;* and of the first order, because it has but one pistil.

T. The corolla in this plant is said to be *wheel-shaped*, it having five parts, or divisions at the edge. But is it *monapetalous*, or *polypetalous* ?

P. *Monapetalous*, because all the parts are united at the bottom into *one*.

T. How do you find the stem, square or round ?

P. Square.

T. In this plant several stems grow from one root, and they all spread about on the ground in a circular form. The stem is said to be *procumbent*, that is *lying down*. Of what shape are the leaves ?

P. *Ovate* or egg-shaped ; here is the plate to illustrate that shape.

T. What else do you find remarkable about them ?

P. They are beautifully dotted on the under side with purplish spots.

T. Of what colour is the corolla ?

P. Of a bright scarlet.

T. This is an extremely delicate flower. When I put it in my tin-box an hour ago, the flower was *reflexed*, that is, the corolla was bent backwards, to the stem, so that the stamens and style stood out naked and separate. It is now turned upwards into a *tubular* form. A similar alteration takes place in a change from sunshine to cloudy weather ; on which account the plant in England received the name of the " Poor Man's Weather Glass." You will find it in this vicinity mostly on dry rocks not far from the sea, where it frequently spangles the ground with its brilliant and beautiful flowers, much like the sandwort, (Arenaria.) It is thus, that the God of Nature has furnished every soil with its appropriate product ; and that we are frequently surprised by beauty and elegance, where we had expected only sterility.

P. Here is the St John's Wort.

T. In what class would you place it ?

P. In the thirteenth, because it has many stamens.

T. There you are in an error. Look at the position of the stamens : in how many bunches do you find them collected ?

P. In three. O ! then it is of the eighteenth.

T. Yes ; the class named by Linnæus *polyadelphia*, or *many brotherhoods*, because the stamens are united in distinct sets. Of this class the vicinity of Boston affords only one genus, the *Hypericum*. Other countries, however, furnish enough to make the number nearly 60, which consists of eight or ten species.

This species is called Hypericum Perforatum, the *perforate* of St John's Wort, from a peculiarity in the leaves, which I want you to examine. Hold one of the leaves between your eye and the light.

P. It is covered with bright dots.

T. These dots are called *pellucid*, a term which signifies that they admit the light to pass through them, and yet are not entirely transparent. All the St John's Worts in our climate possess this property in a greater or less degree ; and by this single circumstance you may know this race of plants from all others. In one or two species, however, the dots are imperceptible without a magnifier. How many styles has this plant ?

P. Three.

T. Yes : and the number varies in different species ; some having five. In what kind of soil did you find it ?

P. In a dry pasture, where I saw hundreds of others, many of them not yet blown.

T. You will see a curious peculiarity also in the stem. A prominent line runs up on each side, making it almost two-edged. Are the leaves opposite or alternate ?

P. Opposite and oval.

T. Entire or notched ?

P. Entire.

T. It is a *perennial* plant ; what is meant by that term ?

P. That the root endures several years.

T. This is, in many places, nearly as common an ornament of dry and sandy soils, as the troublesome White Weed, (Leucanthanum Chrysanthemum.) I know of no use to which it may be applied either of fodder for cattle, domestic economy, or medicine. Yet it would be taking too narrow a view of the works of creation to say that any plant or animal was created in vain ; because its utility happened not to be manifest to our limited reason.

ART. IX.—*First Lessons in Latin, upon a new plan ; combining Abstract Rules with a Progressive Series of Practical Exercises.* By Charles Dexter Cleveland. Boston. Carter & Hendee. 1829. 12mo. pp. 197.

In our last number we promised some notice of this work. We are of the opinion that it needs but be known, to be highly valued and extensively used. We cannot better exhibit it to our readers, than in the words of the author, whose preface here follows.

'It is not necessary to commence a few prefatory remarks to this little volume, with any apology for its appearance. The character of the present age does not call for one, distinguished, as it preeminently is, for its exertions in the department of education; and looking with complacence at least, if not with approbation, upon every attempt to improve the course of youthful instruction.

'Such an attempt is the present work. As soon as the author entered upon the dutes of an instructer, he felt convinced of the inadequateness of the present method of initiating youth into a knowledge of the Latin language; thinking it contrary to the dictates of common sense, as well as to the principles of sound philosophy, to commence the instruction of youth in any language, by giving them abstract rules to be commited to memory, unattended with any practical exercises, by which those rules might be clearly understood and determinately fixed. Accordingly he began with his own pupils, upon the black board, the germ of the system of which the present volume is the maturer growth, and found his theoretical opinions supported by the happiest practical results. The manuscript was then commenced, (December, 1827,)and shewn to a few friends—scholars and practical men—who encouraged its completion. Numerous avocations, however, have delayed the appearance of the work till the present time, when it is presented to the fraternity of instructers to examine, and to determine upon its merits.

'The plan of the work is so simple that it hardly requires any explanation. The system of double translation has been adhered to throughout: examples being given, under most of the rules and formulas, of Latin to be translated into English, and of English to be translated into Latin. After a noun of the first declension has been declined, examples follow of nouns of the same declension in the oblique cases, the numbers, cases, and definitions of which will be required of the pupil. Similar exercises are prepared upon all the declensions; upon the adjectives, verbs, and rules of syntax; vocabularies to which will be found at the end of these divisions respectively. Thus the learner's ingenuity will be exercised, and thus the study of grammar will not be a mere task of the memory, but will make demands, simultaneously, upon the reflection and understanding.

'In the Syntax, the arrangement of Adam's Latin Grammar has been strictly adhered to, and even its rules have, generally, been

given without alteration; for so far from the present volume having been designed to supersede, it is rather intended as an introduction to that most valuable work; and of course, the nearer the approach to its forms and general arrangement, the better.

'It will be perceived, at once, that the "FIRST LESSONS" contain only the *general principles of the language*, without any of its anomalies. This, it is thought, must also be considered an improvement—THAT OF EMBODYING THE ESSENTIALS OF THE LANGUAGE. The reason why boys generally advance so slowly in the early stages of their Latin studies, is, that so much has been put before them, that they have been both utterly confused, confounding the *essentials* with the *unessentials*; and quite discouraged, seeing so much to be learned.

'The catechetical form has been adopted, from a conviction of its superiority for infusing instruction into young minds. Different individuals will propose a question, the same in reality, in a different form; and even the same person will, at times, vary his mode of expression. But when children know exactly what will be asked, they will know exactly what to answer.

'In the composition, the most simple style and language have been used; for those only who have had experience in instructing, know how much the language of schools books, generally, is above the comprehension of those for whom they are designed.

'The present volume will shortly be followed by a "SEQUEL—" a Reader, with notes referring to Adam's Latin grammar for all the exceptions and irregularities of the language not contained in the "FIRST LESSONS."'

The discouragements alluded to by the author may be understood, even by those who are unacquainted with the subject, from the opinion of one of our ablest instructers, that 'it generally takes boys about a year to commit the grammar,' that is, they must labour a year upon *unintelligible forms*. This labour of committing to memory is unavoidable, for we believe that even Hamilton does not profess to get rid of it entirely. Mr Cleveland has endeavoured to abbreviate it, by confining it to the 'essentials;' and to alleviate it, or rather to infuse an interest into it, by making *intelligible* what was before *unintelligible*;—by showing the pupil, that what he is committing has a meaning and use, that that meaning may be clearly understood, and that there is a pleasure in understanding it.

We regret that the author did not give the explanations, which he professedly leaves to the instructer, in his note on page 2; particularly as we never yet saw a definition of *genders*, which, taken in its most obvious sense, was not absurd.

ART. X.—1. *The Latin Tutor, or Exercises in Etymology, Syntax, and Prosody, Compiled in part from the best English Works, with Additions.* By Frederic P. Leverett, Principal of the Public Latin School in Boston. Boston. Hilliard Gray, Little, & Wilkins. 1829. 12mo. pp. 348.

2. *Key to the New Latin Tutor, or Exercises in Etymology, Syntax, and Prosody.* 1829. Boston. Hilliard, Gray, Little, & Wilkins. 12mo. pp. 100.

THIS is incomparably the best work on this subject, extant in this country. It is published without preface or remark; which we mention only to express our regrets, that we are thus deprived of the opportunity of extracting, and presenting to our readers a description of the materials, arrangement, and peculiar facilities of the work, in the author's own words. It embraces the following topics. Etymological Exercises; Exercises in Syntax; Explanations of Idioms, with exercises; a kind of vocabulary explanatory of Idiomatic Phrases, and Prosody. Under all these heads, the book is as copious as could be desired; indeed, as much so, perhaps, as the just consideration of its utility would warrant.

The system followed in the Syntax, is nearly as follows. After the statement of each rule or principle, there is given a model, or English sentence correctly translated into Latin, sufficiently extensive to illustrate all the variety of forms in which the rule may be applied. Then follow exercises, after the usual method, of English sentences in one column, and the corresponding Latin words in their primitive form, in the other. Next, a quantity of 'English sentences to be turned into Latin,' without the correspondent Latin words; but with occasional hints interspersed, and an explanation of the more difficult words at the close. Then comes exercises in phrases, if the rule involves any. The whole work is also interspersed at proper places, with recapitulatory Exercises. Of the idioms and Prosody, (the large half of the book,) to attempt a description, would be to transcribe them; or at least, to go into details, which the proper character of these notices will not allow. The rapid sale and unusual approbation, which the work has hitherto experienced, bear sufficient testimony to its excellence; of which, truth compels us to say, but a very faint idea can be found from the sketch here given. The author has done a service to the cause of letters, which will not, we think, be soon

forgotten ; and we sincerely recommend the book to the examination of instructers. The typographical execution ought not to be passed unnoticed. The Key is by the author of the New Tutor, and contains all the exercises of the same in correct Latin. By this means the labour of teachers is very greatly alleviated, and a service rendered to the cause, which they cannot but highly appreciate. The Key 'will be sold to instructers only.'

INTELLIGENCE.

Essay on the Honey Bee.

[Concluded from page 186.]

Of the construction of the Combs and Cells.—There appears on examination an astonishing air of grandeur in the internal arrangement of a bee-hive. The curious eye can never be weary of contemplating these ingenious workshops, where thousands of labourers are constantly employed in various departments for the common interest. The regularity and geometrical exactness in their works, their magazines replenished with every necessary for their support, the young brood in their cradles ; and the tender care of their nursing mothers towards them, the art and skill displayed in the construction of these nests or cradles, all combine to exhibit a picturesque scene calculated to strike the contemplative mind with wonder and admiration. The combs always originate at the top or arch of the hive, in parallel sheets extending to the bottom, with their edges towards the front. There is usually an interval of one third of an inch between each comb, and this for substantial reasons. Were the combs too distant, it is evident that the bees would be greatly dispersed, and unable to communicate their native heat, reciprocally, without which the eggs could not be hatched nor the brood receive sufficient warmth. Were the combs too close, on the contrary, the bees could not freely traverse the intervals, to carry on their necessary labours. A certain distance therefore, always uniform, is requisite, and nature, which has taught bees so much, has instructed them in the regular preservation of an equal distance throughout the whole surface of parallel sheets of comb. In order to shorten the courses round the surface of large combs, and between their edges and the sides of the hive, they open perpendicular regular streets wide enough for two bees to pass abreast, throughout their whole city. The sheets of comb are uniform, and in size proportioned to that of the hive, but in hollow trees and sometimes in other situations they extend five or six feet in length, and however ponderous when loaded with honey, they are suspended from the top, to which

they are cemented with an adhesive substance called propolis. The thickness of each comb seldom exceeds an inch, and a block of twelve or thirteen inches square, according to Reaumur's calculation will contain 9000 cells.

The combs are constituted by a multitude of cells united, of different diameters adapted to the different kinds of bees to be bred in them. The royal cells in which the queens are bred being of a very peculiar form, and fashioned with great labour and skill. They are of a pyrimidal form, with a wide base and a long diminished top, hanging perpendicularly in the hive, the point downwards. The cells for drones are in diameter three and one third lines, and those of the workers two and three fifths lines, and these dimensions are invariably observed in all hives. The structure of the cells has ever excited admiration in all who have examined them with the eye of curiosity; as it is demonstrable, that these little insects have intuitively discovered the only figure adapted for containing the greatest possible quantity in the least possible space. Their form is exactly hexagonal, by which no room is lost, as the circumference of one makes a part of the circumference of another, while, where they contrived in any other shape, there could not be so many cells of equal capaciousness in the same given space. These cells, which are very thin, are strengthened at the entrance by a fillet of wax, and also at the bottom by the angle of one admirably falling in the middle of its opposite. The cells which contain the young brood are separate from those which are the receptacles for the honey, but the same cells are employed for several successive broods, and when the whole have come to maturity the cells are cleaned out and filled with honey for the winter store. It may not be easy to conceive how bees can fill horizontal cells quite full of honey, and yet prevent it from escaping, but each cell is sealed with a flat covering most ingeniously devised. A circular border is formed round the mouth of the cell which is gradually diminished by other concentric circles, until the aperture remains a point capable of being closed by a single grain of wax. Thus we see the combs and cells constructed with profound skill, forming a wonderful and beautiful fabric, guided by that instinct which the Creator has seen fit to impress on the constitution of our favourite insects. Can the mechanical art here displayed, be exceeded by the reasoning powers of intelligent man? Should a comb in its construction take an oblique direction, it is artfully brought into a perpendicular line to preserve the regular order in the streets. In October, a certain comb burthened with honey, had separated from its attachment, and was leaning against another comb so as to prevent the passage of the bees between them. This accident excited great activity in the colony, but its nature could not be ascertained at the time. At the end of a week, the weather being cold, and the bees clustered together, it was observed through the window of the box that they had constructed two horizontal pillars, betwixt the combs alluded to, and had removed so much of the honey and wax, from the top of each, as to allow the passage of a bee: in about ten days more, there was an uninterrupted thoroughfare, the detached comb, at its upper part, had been secured by a strong barrier, and fastened to the window with the spare wax. This being accomplished, the bees removed the horizontal pillars first constructed, as being of no farther use.*

* American Quarterly Review, June 1828.

Whether we consider bees in the light of machines, a sort of animal clock-work, or as having a soul connected with the machine, it is certain that they are incapable of improvement in instinctive sagacity, nor can they deviate materially from the laws which nature has prescribed. Their instinctive powers are exactly sufficient for their purposes, and all their wonderful works, habits, and economy are precisely the same now, that they were known to be in the infancy of their history. And so long as our fields and gardens shall afford flowers, so long may we expect to share with the busy bee in their luxurious food.

Bees, by some means inexplicable to us, procure a peculiar resinous substance called propolis, or bee glue, with which they stop all crevices, to exclude insects, air, and light; and employ it as a tenacious cement, to attach their combs to the top of the hive. Another substance of indispensable use bees have the faculty of collecting from the stamina of flowers, known to botanists by the term of pollen, or farina. This substance they collect, from early in the spring till interrupted by the frost in autumn. They transmit it to their hives in the form of little balls or pellets attached to the hollow of their legs, and store it in their cells. It is of a yellow, or straw colour, or reddish, according to the flower from whence it is obtained. It is converted to no other use in the hive but as food for the young brood, and is therefore called *bee bread*, and the workers take it grain by grain in their teeth and carry it to the mouths of the larvæ. The fact has been decided by experiment that without this substance the young brood cannot be sustained, and the whole species would be annihilated. By some apiarians, pollen has been considered as the basis of *wax*, but it is now ascertained that it possesses none of the properties of wax. It is decided that wax is formed from honey, elaborated into form by a process which it undergoes in the stomachs of the bees; the particular operation is a secret concealed from our research. *Honey* is a choice fluid extracted from the nectary of the finest flowers. The bees commence their labours early in the spring, and continue their employment with indefatigible industry till autumn, and it is not uncommon for a single swarm to accumulate from 80 to 100 pounds of honey during the season, besides constructing the combs and nursing the young brood. Being a vegetable production, the properties of honey depend entirely on the nature of the particular plants from which it is extracted, and its qualities are different in different countries. The comb first made by a new swarm, is of the purest and most delicate white, and the honey which it contains is of the purest kind and of delicious flavour, and is called *virgin honey*. The flowers which appear earliest in summer, yield honey much superior to that which is obtained in autumn.

The absurd and cruel practice of destroying bees in autumn to obtain their stock of honey, still too generally prevails. The method is, to suffocate them by the fumes of burning brimstone, which ought upon every principle to be abandoned. It is for our interest to multiply the species; to annihilate differs but little from that of skinning a favourite horse for the sake of his hide. By the improved method of constructing hives furnished with boxes, we have the advantage of obtaining the purest honey, free from bee bread or the young brood, and it is a luxury which no one would be willing to relinquish who has once enjoyed the repast. The boxes may be taken out at any time during the summer without destroying the bees, and each hive will

afford about thirty pounds of honey, reserving a sufficient quantity for the bees' subsistence during winter.

Of Swarming.—When a hive is overstocked with numbers, and crowded for room, preparation is made to send out a new swarm, and form an independent colony, which is always headed by a queen. This seldom takes place before the month of May, nor after July; it is always on a clear sunshine day, and between ten and three o'clock. The bees suddenly appear in great numbers at the mouth of the hive, and rush out in a tumultuous manner, and with a buzzing noise, rise into the air, flying in all directions. In a few minutes the queen and her suit alight on some neighbouring shrub or branch of a tree, and the whole posse gradually unite round her in a large cluster, clinging to each other by their legs. They are now put into a new hive where they immediately commence their labours and increase their numbers. When swarming, bees are less disposed to sting than at any other time, which may probably be ascribed to their being freed from the charge of their young brood, but every movement indicates attachment and devotion to their queen; whatever direction or stand she may take, she is the rallying point, where the multitude assemble. In one instance the queen took her stand about the head or neck of a young woman who was assisting in hiving a swarm; instantly the whole upper part of her body was covered with bees. The spectators were exceedingly alarmed lest she should fall a sacrifice. The owner urgently directed her to be firm and stand perfectly still while he searched for the queen. After much difficulty she was secured and put into the hive; the bees were now dispersing, but the queen unfortunately returned to her station, and pressed into the cluster as if to elude pursuit, and the bees renewed their station. The affrighted girl cryed out for assistance; most fortunately the queen was again taken and secured in the hive, when all her people followed and left the girl without a single sting. Had she acted in opposition to the bees and excited their wrath, it might have been at the expense of her life. The late Rev. Dr. R———, having had occasion to hive a swarm of bees, perceived that they were flying before him and buzzing round his head, he followed them to a considerable distance, till at length it was observed that the queen had alighted on the corner of his hat; finding himself thus crowned by her majesty, the doctor deliberately returned home with his charge, and accommodated the royal family with appropriate apartments. An instance may be mentioned of a swarm of bees voluntarily entering the garret of a dwelling house through a crevice under the shingles. They attached themselves to the sides of the chimney at the gable end. In this situation for three years past they have greatly increased, and accumulated comb and honey more than sufficient to fill a barrel, from which the family receive a handsome rent at pleasure.

Notwithstanding their capability of defence, bees are subject to the annoyance of numerous enemies. The most destructive in our country is the bee-moth or miller. This insect destroyed more than a hundred hives in a few towns in this country the past season, and in many places bees are entirely annihilated by their ravages. It has long been a desideratum to devise a preventive of their depredations, and there is great reason to hope that a remedy has been discovered, and

is announced in a treatise on the subject of bees just published by Messrs. Marsh & Capen of Boston. The kingbird, martin, and others are enemies to bees, and watch opportunities to take them on the wing. But of all others the bear is their most formidable enemy. It is recorded by good authority, that a bear has been known to take a hive of bees in her paws and carry it to the nearest river or pond and plunge it in to drown the bees that she may feast on the spoil. In countries therefore, frequented by bears, beehives are secured by being chained to a wall. Few persons are aware of the great profits and advantages arising from the culture of bees. No country possesses greater advantages for their cultivation than our own, and we know of none in which it is more grossly neglected. The time and the capital required is of little importance. Mr. Huish, an English apiarian, asserts that two hundred hives may be properly managed by one person, with some slight assistance, during the swarming season. He states the profits of five years, on a fair and equitable scale, making, at the same time, fair and ample allowance for the losses which even the most skilful apiarian cannot prevent. 'Suppose a person purchases a swarm for one guinea, the actual profit at the end of five years will be £63, 14 4 sterling. The great importance of this branch of agriculture to a country will appear, when it is considered that England pays annually to the north of Germany, and Italy, 80,000*l.* sterling for the produce of the bee.' According to a modern author, it has been estimated that the little island of Corsica, in former times, produced no less than 400,000 lbs. of wax, and six or eight million pounds of honey, annually: an immense source of wealth for a little island, and all from the labours of a little insect. The culture of the bee is a particular object of the Hanoverians; their produce of wax in 1787, was estimated at 300,000 lbs., and of honey, 4,500,000 lbs., a most incredible quantity to be collected in one year.

Even in America, honey and wax are imported to a very considerable amount, but were proper attention bestowed on the subject, the necessity for importation might be entirely superseded. A hundred fold more bees might be supported than now have existence in our country. An apiary would be a source of profit and amusement, as an appendage to every rural establishment. With great propriety therefore, we may enjoin it upon our friends, in the language of the French bishop to his empoverished clergy, '*Keep bees, keep bees!*'

Central School of Arts and Manufactures, designed to form Civil Engineers, Directors of Mill Works, Heads of Manufactories, &c. &c. Authorised by his Ex. M. de Vatismenil Master of Public Instruction. Founders, Messrs. Lavallé, Director; Benoit, Dumas, Olivier and Peclét, Professors.

This School was founded by the assistance, and is placed under the superintendance, of a council of improvement [perfectionnement,] composed of—

Messrs. the count Chaptal, peer of France, member of the Institute,

—Arago, member of the Institute,—Berthier, chief engineer of mines, member of the Institute,—Alex. Brongniart, director of the royal manufactory of porcelain, member of the Institute,—D'Arcet, member of the Institute,—viscount Héricourt de Thury, director of works at Paris, counsellor of state, member of the Institute,—baron Heron de Villefosse, district inspector of the mines, counsellor of state, member of the Institute,—Jomard, member of the Institute,—Laffitte, deputy,—Molard, senior, member of the Institute,—Odier, deputy,—Payen, chemical manufacturer,—Casimir Périer, deputy,—baron Poisson, member of the Institute,—baron Ternaux, deputy,—baron Thénard, member of the Institute and deputy.

PROFESSORS.

Descriptive Geometry.—M. Olivier, founder, former pupil of the polytechnic school, past officer of artillery, ex-professor of the school of application at Metz.

Natural Philosophy.—M. Péclet, founder, former pupil of the normal school, master of conferences at the preparatory school, ex-professor of Natural Philosophy at Marseilles, &c.

Practical Mechanics.—M. Bénoit, founder, former pupil of the polytechnic school, ex-professor at the school of military engineers, [état-major] civil engineer.

General Chemistry and Chemical Arts.—M. Dumas, founder, tutor at the polytechnic school, professor at the Atheneum.

Course of Analytical Chemistry.—M. Bussy, former pupil of the polytechnic school, professor at the school of pharmacy.

Practical Natural History.—M. Ad. Brongniart, doctor of medicine, censor of the medical faculty of Paris.

Working of Mines.—M. Bineau, former pupil of the polytechnic school, engineer of mines.

Art of Building.—M. Goublier, architect of public works, recording and corresponding secretary of the council of civil edifices, &c.

Political Economy and Statistics.—M. H. Guilleminot, advocate at the royal court of Paris.

Design.—M. Leblanc, professor of design to the royal conservatory of arts and trades.

ADJUNCT PROFESSORS.

Descriptive Geometry.—M. ———

Natural Philosophy.—M. Colladon.

Mechanics.—M. Didiez.

Chemistry, Chemical Arts, and Analytic Chemistry.—M. Bergouhnioux.

I. *General considerations upon the design of the School.*

All men who reflect upon the great interests of the country, cannot look without fear upon the future prospects of French industry. For some years, the greatest part of the enterprises of industry have experienced serious obstacles; and the public, which in reality alone maintains them, and can alone maintain them, judges of their progress from their results. Since the latter are for the time being unproductive, many men, too little enlightened in regard to the nature of manufacturing speculations, without going back to the cause of these checks, hasten to withdraw from industry, even with great losses, the capital which they had invested in it; and most frequently they withdraw or refuse

them at the very moment when they are on the point of reaching the end they wished to attain.

Persuaded that hazard has not had an unimportant share in the events which have influenced the march of industry in a manner much to be regretted, the founders of the new School have wished to apply the remedy at the very root of the evil.

An attentive comparison has proved to them, that the superiority in industry of England was due to the division of labour and to the specific perfection of each element of industry in the country. In order to compete with her, it is therefore necessary to have, like her, highly experienced workmen, skilful overseers, directors of establishments still more skilful, and civil engineers, who, devoting themselves to one particular kind of construction of industry may sound all its practical difficulties.

These engineers, free, without any dependence upon government, and specially devoted to one or more branches of industry, are, in relation to each of them, what architects are in France in relation to building operations ; they give counsel, and direct the execution of their plans. It is to the civil engineers that England owes almost all the discoveries and improvements which have been made in practical industry ; since this profession is in England as honorable as it is lucrative. In France, civil engineers are still few. It is easy, nevertheless, to see of what importance to industry, men of extensive theoretical and practical instruction would be, exclusively occupied with a few branches of industry, whose fortune and consideration should depend solely upon their labours. Their importance would be so much the greater, as the engineers of the government would probably become, what they are in England, inspectors of works directed by civil engineers.

But if the most pressing want of France, that to which public attention is at present most directed, appears to be the creation of civil engineers, it is nevertheless to be feared that a school exclusively devoted to them cannot support itself without the assistance of the government, on account of the very considerable expenses which it requires. At all times France will feel how important it is to her to see engineers formed, who will render possible the ameliorations called for in many of the public services, engineers whose knowledge will spare the operatists the errors which have so often brought on the ruin of their establishments, and who will inspire capitalists with the confidence necessary to insure their perseverance.

But we must repeat it, a school which should be solely designed to create civil engineers, could not at present support itself. Fortunately, the instruction which it is designed to spread, is equally suitable to other men, whom we have thought proper to invite to profit by it.

These are, directors of establishments and capitalists; as well as young men who are designed for instruction in the practical sciences. For, in order that industry may develope itself in France, it is necessary that the practical studies should enter into our manners ; and that to such a degree, that each capitalist may find, either in himself or around him, useful counsel relative to the employment of his capital.

The moment appears favorable ; since, for some years, the importance of the study of the sciences has been generally appreciated, and if any doubts may still arise upon the various advantages which the country or individuals may derive from this study, they would be removed from

the high reputation which the polytechnic school has acquired, and by the happy influence which this fine establishment exercises over the public works. These doubts ought still to cease, even if one chose to set the polytechnic school aside ; for then, it would be sufficient to examine the actual direction of studies among the numerous young men whom a long and happy peace leaves free in their tastes and in their plans for the future. These young men have a remarkable tendency towards the study of the positive sciences, of which they feel the need in their actual or their future occupations.

But in the study of the sciences, as in all other studies, distinctions are to be established. With certain men, the search of truth is a lively passion, to which all their existence is consecrated, to which all their interests are sacrificed. These men, little numerous, study the sciences for their own sake. They love to sound their depths, to conquer, or at least to measure their difficulties ; and for them, instruction could never be sufficiently detailed, nor sufficiently abstract. The mass of young men, on the contrary, seek in the study of the sciences a complement of education, without which one finds himself at the present day out of place in society. They wish in consequence an instruction rapid, clear, and concise. They seek opinions ready made ; they fear difficulties, because they have not the time to investigate and conquer them. They shun details, because their attention is sustained neither by their direct interests, nor by a natural disposition of mind.

Between these two classes, so distinct, is found a third much more considerable than the two first, for whom the teaching of the sciences ought still to be modified. This is the class of men destined by their condition to make a daily application of scientific conceptions.

These ought to be considered as having in view only the interest of their future position. The sciences are for them instruments, which ought to be made of easy and sure application. In regard to them, every thing in scientific instruction ought to be subordinate to the end which they have in view : general ideas ought to be arranged like facts in their minds, without the circuitousness of uncertain theories or of complicated details. The phenomena which attach themselves to applications ought on the contrary to be studied with depth in their theoretical relations, and with detail in a practical point of view. In this manner each deriving a true and simple idea of the subject as a whole, the pupils will be initiated into the chances of practice, the accidents which it brings, and the remedies which experience has made known, or which theory points out, against a crowd of difficulties, minute, but nevertheless so important.

There are then three very distinct divisions for instruction. It would be easy to show how all the establishments arrange themselves under one of them ; but this general discussion would here be misplaced and useless. We wish to form a school of application ; by consequence, a school directed in the sense of the third class. This then is the only one which ought to fix our attention.

We are about to show under what relations the new school may be useful to the country, and at the same time from what motives its creation has seemed to us necessary.

Young men find in France, at leaving the colleges, special schools for law, medicine, theology ; civil, military, and maritime craft, the fine arts, and even commerce.

But those who are destined to practical industry no where find the instruction suited to them.

In fact, the establishments of practical instruction which exist in France, are, the conservatory of arts and trades, the schools of Chalons and Angers, and the schools of workmen established recently by government in a great number of towns, at the request of M. Dupin.

The isolated courses of the conservatory cannot attain the end which we propose to ourselves in creating our school. It is evident, and no one at the present day denies it, that in the study of practical science, oral lessons are not sufficient. They ought to be accompanied by frequent examinations, by numerous experiments and manipulations, by graphic representations, by solutions of problems, performed by the students under the eyes of the professors; and these various means of instruction ought to be combined among themselves in such manner as to form a complete system of teaching.

The schools of Chalons and Angers are designed only for certain particulars in mechanics.

Finally, the public courses of elementary geometry and mechanics, which happily are multiplied in these later times, are principally instituted in favour of the working classes.

It may then be advanced, that as yet there no where exists in France a complete instruction of the practical sciences, but it is no more than just to remark that this instruction could be organised only where the business people should be convinced that they all have need of the elements, well arranged among themselves, of geometry, natural philosophy, mechanics, chemistry, the art of building, statistics, and even of natural history. They ought to have this conviction now, for they see every day that the progress and discoveries of a particular industry are due to knowledges which seem to be wholly foreign to it.

The Central School of Arts and Manufactures is established in order to satisfy this want, warmly felt by French industry, of a complete instruction in the practical sciences.

This institution has then for its object to propagate the knowledge of geometry, natural philosophy, mechanics, chemistry, natural history, and statistics; these sciences being considered in their application to the arts of industry.

Its special end is to form directors of establishments, heads of manufactories, civil engineers, constructors, and besides to give to all those who might wish to take part in the speculations of industry the instruction which is necessary to them, whether to appreciate their value or to superintend their progress.

Independently of the special end, of which we have just spoken, young men, whatever may be their future direction, will find in the School a positive education, which will inspire them with a taste for labour, because they will see that labour guided by science is fruitful in useful results.

Thus the instruction which young men will receive at the Central School of Arts and Manufactures, will offer to those, who shall distinguish themselves, a new career, as honorable as it is lucrative; to those who are to direct establishments, an indispensable instruction, and to all, a complement to a college education, in harmony with the spirit of our institutions, and of which the importance will be more and more felt, in proportion as French industry shall receive new developements, and its political influence be better appreciated.

In the organization of the Central School of Arts and Manufactures, the ancient polytechnic school has been taken as a model, adopting always the modifications required by the nature of the end which it is desired to attain. Thus, all that concerns the too elevated mathematical theories has been set aside from the instruction, experience having shown that these theories are rarely useful in application, and that, where this is not the case, the simple enunciation of the results obtained by a transcendent analysis may be sufficient.

Hence, supposing the duration of the studies to remain the same, the students will be able to give much more time to graphic works, experiments and manipulations, and to receive an instruction more fully developed upon the various applications of the sciences to the industrious arts. This disposition allows besides of the introduction of many important improvements in the system of studies; first, by the creation of numerous meetings, which have for their end to excite in the pupils the spirit of invention so necessary in the practice of the arts, directing it towards a useful end, and carefully correcting the dangerous wanderings of an imagination too lively and too mobile; secondly, by causing the pupils to execute at least four hundred labelled sketches of folio size, representing machines, plans, and details of every description, taken with care from establishments in operation, or from models of abandoned machines, and in fine from the studies of construction, &c. They will thus acquire the knowledge of a multitude of facts, which will serve as bases to their inventionary compositions; thirdly, by laying before the meetings complete plans of establishments, in the course and at the end of the second year of studies, which shall have for their object to teach the pupils to study with care the varieties which should enter into the creation of a branch of industry, to compare them, and to combine them in the manner most advantageous according to localities.

A gold medal will be decreed to each of the three best plans of the last meeting, and the School will publish them at its own expense.

The founders have sought to facilitate the access to the School to all classes of society, and in particular to young men who might wish to devote themselves to teaching, by the creation of three half-pays, by the appointments allowed to the heads of studies, and by the temporary places of tutors given to the pupils who shall distinguish themselves in their studies.

All the courses of the School form in reality only one same and single course, because it is in vain to attempt to establish limits to confine the attention of the pupils to such or such a point, to circumscribe their education in plans more or less suitable to their respective destination. For us, practical science is one, and every practitioner ought to know it in its fulness, under penalty of being inferior to the competitor who shall present himself better armed than he in the lists. For us, too, practical science is composed of elements very clearly determined; for it is sufficient to establish that industry always exercises itself upon given materials, with the design of augmenting their value, and by having regard to certain geographical and social conditions, in order to point out with precision what are the sciences necessary to the practitioner.

Geometry teaches him the relations of bodies among themselves; natural philosophy teaches him to put them in motion; mechanics

shows him by what methods these movements are modified, diminished, or increased; chemistry, dividing these bodies into molecules, teaches him to separate the elements which compose them, to combine these under a new form, and to foresee all these effects, whether art determines them, or chance produces them. Thus far we suppose that the materials are given; but if the question is how to obtain them, the miner and the naturalist come to teach how to extract them, or how to produce them. All the operations of industry generally require particular constructions which the superintendent often finds it necessary to direct in person; and this he will learn to do in the course on the art of building. Finally, in order to arrive at the useful application of all these theoretical conceptions, it is necessary still to acquire a knowledge of the resources of the country, and of the social relations, either existing or prospective, in which one is placed; and it is to accomplish this end that our course on statistics and political economy is designed.

Let us add that if the ideas just advanced are comprehended in the sense which we attach to them, it amounts to demonstration that our courses differ from all analogous ones, and that they cannot resemble them for this reason, that they carry with them an idea of oneness, which perhaps has never been applied in teaching the sciences. We ought also to say that, even setting aside this idea of oneness which we have chosen, courses of the pure sciences and those of the practical sciences must still be necessarily considered as very different.

All the branches of industry, without exception, are founded on one or more of the sciences either exact or experimental. Nevertheless, the practical arts are not simple applications of the theoretical sciences. The mechanics, the natural philosophy, and the chemistry of the arts, are sciences by themselves, founded, it is true, upon the theoretical sciences, but which borrow from them only their method of investigation and the general principles which they possess, and which still are often insufficient.

Theoretical and practical researches differ essentially both in their nature and their end. In fact, in the theoretical sciences one has principally in view to establish general laws, and almost always neglects elements which in the arts are of great importance. Often, also, in order to simplify the calculations, suppositions are made which lead to results different from those of observation. Thus in the researches of the laboratory, no account is kept either of the number of operations, or of the time employed, or of the quantity of combustible consumed; and yet these various elements are very important in the arts, since they have great influence on the expense. Thus, again, many of the laws relative to the motion of fluids are inexact, because theory has built them upon hypotheses that are true only in certain circumstances which practice never presents. It may be added that the theoretical sciences are composed of generalities still too incomplete to admit the possibility of deducing from them the exact laws of that multitude of complicated phenomena, which are met with even in the most simple arts.

The preceding observations are undoubtedly sufficient to give a clear conception of what the founders mean by the *practical sciences*, and therefore to make it understood also that courses of the exact and experimental sciences, to which might be added the description of the

arts, could not constitute alone an instruction profitable to practical men.

In order that the instruction given in a school of industry may be truly useful to the pupils, it is absolutely necessary that the professors who are charged therewith should have been long occupied with the theories, which they have afterwards put into form by application, or have taken part, as engineers, in the various labours of the public service; because it is in the workshops, and there only, that one judges with certainty of the real importance of theories, of the manner of making use of them, and of the limits beyond which their useful operations cease. Again, it is absolutely necessary that the courses should be intimately united with each other, that all the labours executed by the pupils should be directed towards one and the same end; and in order to insure that the pupils may understand the lessons, in order to assist their understanding, in order to stimulate and develope among them the spirit of invention, it is necessary, in fine, to have daily examinations, problems to resolve, designs to sketch, plans to compare, experiments and manipulations to perform, and all this under constant supervision.

It will undoubtedly be perceived, after this exposition of the ideas which have given rise to the organization of the new school of industry, that it could not be created by one man alone. It was necessary, whether to conceive or to execute it, that the founders and professors, chosen in the age of activity, should be in sufficient number to embrace the vast field of industry; and that all, deeply penetrated with the end and the extent of their labours, should be willing to devote themselves almost entirely to a career which is not yet marked out.

When we consider the numerical importance of the manufacturing class, of the part which it acts in a political point of view in our new institutions, and of its participation in the budget of the state, we are astonished that there is not yet in Europe a school for its particular accommodation. But this astonishment must cease, when we examine more closely what the school of industry ought to be, and the difficulties which the organization of such an establishment presents. After what we have said, these difficulties cannot but seem already great, but they will appear still more so, when we add that the establishment thus formed would be incomplete, if the education of the pupils were not pursued farther under the relations of practice both extended and particular.

For these common studies may be sufficient for those pupils who design to engage in manufactures as capitalists, for those who are to direct simple branches of industry, and, in fine, for those who have followed the courses of the school only as a complement of education; but these studies are insufficient for those who wish to devote themselves to the complicated branches of industry, or who propose to become architects or civil engineers. These must have a complement of theoretical teaching, or a deeper practical instruction in the direction which they are going to follow.

The founders have thought that it was necessary to attach to the school a special instruction, which shall be variable in its duration on account of the end which the pupils propose to themselves. This instruction will take the pupils at leaving the school, and qualify them to enter immediately into practice.

The principal grounds of its organization are as follows; at the end of the two years' studies, the pupils will name the career for which they design themselves. They will be arranged in divisions, and these divisions will be placed under the superintendence of the professor to whom their intention has particular relation. He will make them work during a longer or shorter time, in order to complete their theoretical education, since he will place them in a workshop, in order that they may put their own hands to the work, may become accustomed to practice on an extended scale, and may see for themselves how a fabric is managed, and how workmen are directed.

The pupils who may wish to devote themselves to the art of building, and also to architecture properly so called, will have their attention directed to all the theoretical and practical studies which will be necessary for them, as well in regard to the art as to the science; and pains will be taken to procure for them the opportunity of following step by step the execution of different works.

Those who shall design themselves for civil engineers, will find in the school special courses of the higher mathematics, and will thus receive the complete theoretic instruction of the polytechnic school.

Finally, in order to render at once more complete and more easy the education of the pupils who shall confide themselves to their care, the founders have thought it necessary to place at their disposal the works in which are found collected all the discoveries which concern the practical arts. These works will be lodged in the library, and placed at the disposition of the pupils of the third year; but as discoveries relative to the arts are often found in periodical collections published in foreign languages, the founders have felt the necessity of insuring a translation of them.

For this purpose they have taken the resolution to publish a journal of industry, which shall contain all the researches relative to the arts which make the basis of the instruction of the School, whether these researches have been undertaken by the professors, or have been published in works, or in foreign journals.

The journal of the School will make known, besides, all the remarkable results of its instruction, and will offer to former pupils the means of communicating to the public the fruit of their researches.

II. *Organization of the School. (Omitted.)*

III. *Instruction.*

The instruction of the School is composed of a general instruction and a special instruction.

The general instruction continues for two years.

The system of general instruction is composed of courses; of daily interrogatories; of drawings; of manipulations in chemistry, natural philosophy and mechanics; of instruction in the great auxiliaries of the mechanical or chemical arts; of problems, plans and meetings on separate subjects; of general examinations; and of general meetings.

The courses of the School commence, each year, on the third of November, and end the first of August. From the first of August to the first of September, the pupils are put under general examinations.

The courses are ten in number, viz:

Descriptive geometry;
Practical natural philosophy;

Practical mechanics;
General chemistry and chemical arts;
Analytical chemistry;
Working of mines;
Practical natural history;
Art of building;
Statistics and political economy;
Design.

The daily interrogatories are made by the professors, the adjunct professors, and the temporary tutors attached to the School. Notes are required to be kept and placed in deposit, where they are made the basis of the classification of the pupils at the interrogatories. This classification is determined by lot, and so managed that chance has too much influence over the order in which the pupils shall be called upon, to admit the possibility of any foresight in this respect. In this manner the pupils are continually liable to examination upon all the branches of instruction; and, by consequence, if they wish to obtain good marks, they must keep fresh the current of their studies, in all the courses.

The results of these daily examinations have the highest influence on the distribution of the diploma.

The drawings are composed of plans made with the dividers and scale, and of outlines sketched by the hand and labelled, relative to all the courses. All the pupils are required to execute the whole of the designs.

The drawings of each course are daily verified by the professors or tutors. An extreme importance is attached to these exercises, which are designed to bring forth in a tangible form the positive results of all the courses. Also the pupils will not be able to remain at the School only as they fulfil on this subject all the obligations imposed on them.

What has been said of the drawings is to be repeated in regard to manipulations. They will be sufficiently numerous to give to the pupils positive notions of chemistry. The laboratories designed for manipulations and experiments are spacious, and a hundred and fifty pupils can labour in them at a time. Each division will manipulate once or twice a week in the laboratories, and besides will perform all the experiments in natural philosophy and mechanics, which shall be judged necessary in each course by the professors.

In fine, there will be placed at the disposal of the pupils all the materials necessary for the construction of large works of art of whatever description. They will establish them themselves after designs which shall be given them. They will put them in operation themselves, so as to learn from experience a precise idea of the operations executed on a large scale.

In order to render the system of instruction complete, to the preceding elements have been added problems to resolve during the first year. From the commencement of the second, there will be laid every month before the meetings, plans by degrees more and more complicated, which will familiarize the pupils, at first, with the details of mechanical constructions, and afterwards, with the mutual dispositions which are the most suitable in every class of establishments.

In order to give to these works a positive character, there will be placed before the pupils the parts of various machines taken to pieces.

They will be set at work to put them together, and sometimes to calculate the dimensions of one or more of the parts of the machine, in order to modify the system. The elements of the machine, calculated by the pupils, will be executed under their inspection, by the workmen attached to the establishment; and when the instrument shall be put in a state to operate, the pupils will submit it to the examination of the professors.

Independently of the interrogatories made during the courses, whether by the professors or by the tutors, the pupils will undergo, at the end of each scholastic year, general examinations upon all the branches of instruction.

The results of these examinations, combined with those of the examinations which take place in the course of the year, and also with the notes taken during the manipulations and experiments, those which belong to each design executed by the pupil, those which accompany the pieces presented at the meetings, and, in fine, those which regard the conduct of the pupil, form a whole, from which the council of studies will decide upon the promotion of the pupils from the second division to the first, and upon the fitness of the pupils of the first division to receive diplomas of capability.

Every pupil, who shall offer himself to the chances of examination, will be retained or dismissed, if he belongs to the second division; and if to the first, he will receive his diploma of capability, or will depart without any certificate of capability, or even of his connexion with the School.

Pupils, who, with the consent of their parents or guardians, shall declare, before the examination, that they intend to pass two years in the same division, will be admitted to that favor. In this case they will not be examined. Pupils who thus double their time, will be exercised upon questions not comprised in the ordinary courses. Their stay in the school can in no case exceed four years.

The founders of the School have wished that distinguished pupils may receive their instruction almost gratuitously. They think that this end is attained by the institution of numerous half-pays, by the appointments placed at the disposal of the heads of studies, and finally by the rewards granted to the authors of the best projects at the time of the general meeting which terminates the studies. This meeting takes place at the end of the second year. The pupils will be required to make a detailed project of some establishment. The pieces submitted at the meeting will be examined by the council of studies, and definitively classed by the council of improvement.

The author of the best project will receive a gold medal worth 600 francs.

The authors of the second and third, will receive each a gold medal of the value of 300 francs.

These three projects will be printed and published at the expense of the establishment.

The plans and memoirs will be deposited in the archives of the School.

The special instruction is reserved for the pupils judged fit to receive the diploma and who shall wish to profit by the means of instruction which the School possesses, whether to become civil engineers, or to investigate any particular branch, or to continue general studies so as to

qualify themselves for becoming instructers. They will no longer be obliged to follow the courses relative to the general studies; but may do so, either wholly, or in part. Generally, the pupils will then be placed under the special direction of the professor of the branch which they wish to pursue. He will afford them daily conferences, to point out to them a plan of operations, to follow their progress, and to designate the portions of the course it would be useful for them to pursue anew. These will find moreover special advice from all the professors, as they may experience its necessity. Courses of the higher mathematics will be established, and followed by all the pupils who intend to become civil engineers. They will thus acquire all the theoretical instruction of the polytechnic school.

Pupils who are intended either for teaching practical chemistry, or for carrying on a chemical or metallurgical art, will receive during this third year special and thorough lessons upon the most difficult parts of general chemistry, or upon the theory and practice of the art which they intend to carry on. Both will be exercised in analyses of precision. The latter will be able besides to devote themselves to the preparation of the products which they are going to fabricate hereafter, and will find in this establishment all that is necessary to the fabrication of chemical products, to that of colours, to the art of dying, to the fabrication of painted cloths and papers, to bleaching, to the maunfacture of paper, to that of sugar, of starch, and of alcohol, to the preparation of fat substances, and to that of soap. They will also have all the means necessary for perfecting themselves in assaying, as well by the dry as the humid way, the workable ores, and the earths which serve for the fabrication of the various species of pottery. Such arrangements will be made that the pupils may acquire a complete knowledge of the labours relative to the treatment of iron, lead, copper, zinc, pewter, &c.

Those who are intended for particular branches of mechanics will be occupied with all the details of construction, of forces, and of machine tools, in the study and the workshops of construction. They will be introduced into factories, in order to study there the machines in motion; and those who shall wish to devote themselves to the art of building, or to architecture properly so called, will find numerous opportunities of following out works of architecture analogous to their intended direction.

NOTICES.

Works in the Department of Education.

The Life and Voyages of Christopher Columbus, by Washington Irving. (Abridged by the same.) New-York. G. & C. & H. Carvill. 1829. 12mo. pp. 311.

We welcome this book to American schools. Its subject entitles it to extensive use as a class book in history; and its style renders it an excellent volume for reading lessons. The information it conveys gives it a high place among useful works; while the incidents, the characters, and the scenery, to which it introduces the mind, have, in a peculiar degree, the attractive interest of romance, and a happy influence on the imagination. It is such a book as our youth generally ought to read, as a first volume of American history; and it is one which, we hope, will take the place of not a few of those well meant but insipid tales with which our juvenile libraries are crowded.

Mr Irving has, in the production of this volume, rendered himself a lasting benefactor to the youth of his country, by the historical instruction and the mental recreation he has afforded them. We speak in warm terms of the work, because we have, we may say, tried it in anticipation, by the regular use of the larger work as a school book, and by the observation of its excellent influence on the minds of the young, as well as its peculiar adaptation to the purposes of reading.

There are, however, other reasons of a more general nature, why we value this book. It is, we should say, of the right length for schools. It goes fully into its subject, without being tedious from unnecessary detail; and it avoids the great fault of most class books in history,—that of becoming a dry and scanty abstract, possessing no interest for the youthful mind. In regard to the character of the work as an abridgment we do not feel called on to speak. For the task of condensing the author possesses distinguished advantages in his intimate knowledge of the subject, and in the simplicity and fluent suavity of his style.

In a new edition, (we would have said, but that we observe the book is stereotyped,) a more rigid revision of phraseology would be desirable,—especially when the work is considered as one which will probably be in very general use.

We may select, in proof, a few instances of obvious inadvertency—'it is evident that the nature of their communications

were generally unfavourable to the admiral.' p. 228—'and what seemed to *lay* (!) equally near his heart.' p. 296—'what visions of glory would have *broke* upon his mind.' p. 310—'The followers of Roldan brought with them a number of slaves, some of *which* Columbus had been compelled to grant them,' &c. p. 226.

The printing of the word Indian, even when it is an adjective, with a small initial letter, *(indian,)* is not in better taste than the word English or American would be, if divested of the capital. Of small matters like these we should not think it worth while to speak, were it not for the tacit influence which they exert on the habits of the young.

A Natural History of the most remarkable Birds, Fishes, Serpents, Reptiles, and Insects. By Mrs Mary Trimmer. With 200 Engravings. Abridged and improved. Particularly designed for Youth in the United States, and suited to the use of Schools. Boston. S. G. Goodrich & Co. 1829. 18mo. pp. 233.

The uncommon neatness and beauty of the cuts in Mrs Trimmer's work seem to make it a universal favourite with young children; although the style of the writer is not always intelligible to such a class of *students*—for we can hardly call them *readers*. In the American edition, the attraction of the engravings is well kept up; and care has been taken to introduce animals likely to fall under the notice of children in this country. Questions are annexed for the convenience of using the volume in classes at school; and no pains seem to have been spared to render the work interesting and useful.

The superior style of the illustrations alone is an excellent recommendation of this book; as in too many publications of this sort, the engravings are so incorrect and clumsy that their bad influence on taste renders them quite unsuitable for the use of children.

Conversations on the Animal Economy; designed for the instruction of Youth, and for the perusal of general readers. By Isaac Ray, M. D. Portland. Shirley & Hyde. 1829. 12mo. pp. 242.

This modest volume conveys a great deal of useful and entertaining information. The style is plain and familiar, yet attractive and interesting. The work seems well adapted for Lyceums; and it is, at the same time, well suited to the objects of family reading. We hope it will find its way into schools, and aid in creating an early taste for knowledge in the important branch to which it belongs.

The National Orator, consisting of Selections adapted for Rhetorical Recitation, from the Parliamentary, Forensic, and Pulpit Eloquence of Great Britain and America. Interspersed with extracts from the Poets. Illustrated by Critical and Historical Notes. By Charles Dexter Cleveland. New York. White, Gallaher, & White. 1829. 12mo. pp. 300.

This is a very superior selection, and prepared with judgment and taste. It offers, however, little that is new or peculiar, and contains, perhaps, too little matter that will interest young speakers.

We long to see a book of pieces for speaking in which the present rather than the prospective mental character of the students shall be consulted. Boys must have liberty to speak as boys—not as men; if we would ever see a natural and easy elocution either in early or in mature life.

Natural History of Quadrupeds; with Engravings on a new plan, exhibiting their comparative size; adapted to the capacities of Youth, with authentic Anecdotes illustrating the habits and characters of the Animals; together with Reflections moral and religious. Designed for Sabbath School Libraries, Families, and Common Schools. By J. L. Comstock, M. D. Hartford. D. L. Robinson & Co. 1829.

This work is one which will no doubt be very acceptable to the young; and the more so that such pains have been taken to consult their wants and wishes in the style and size of the illustrations. In infant and elementary schools generally these volumes will be found of great service, in awaking the mind to an early interest in the study of Life,—that peculiar manifestation of creative Wisdom. In Sunday schools themselves they may, we should think, be used with perfect propriety, and to great advantage.

The School Dictionary, Designed for the use of Academies and Common Schools in the United States. By William W. Turner, A. M. Instructer in the American Asylum. Hartford. H. & F. J. Huntington. 1829.

Our readers are not unaware that we have often had occasion to advert to the great deficiencies existing in school dictionaries, from their want of adaptation to the purposes of early instruction, the abstruse terms with which they abound, the unintelligible definitions attached to many words, and the utter absence of any thing like a judicious selection, calculated to meet the capacity or stimulate the advancement of the young mind.

'The object aimed at by the author' of this work 'in executing his design, was, to select, from the English dictionaries, those words which are used in conversation, and which occur in common books, and to define each word in a manner as concise and simple as possible, noting the accent and the part of speech.'

More explanation and illustration in the statement of definitions would be desirable in a work like this. A clear understanding of the actual meaning of a word is much more useful to young persons, than the ability to give,—by memory, perhaps,—a very exact definition.

On the whole, however, this book seems well adapted to the object it proposes, and will probably be very useful in common schools; though we cannot but doubt whether it is the right sort of work for academies, which would seem to require a more copious volume.

The New Speaker, or Exercises in Rhetoric, being a Selection of Speeches, Dialogues, and Poetry, from the most approved American and British Authors; suitable for Declamation. By William B. Fowle, Teacher of the Monitorial School, Boston. Boston. Hilliard, Gray, Little, & Wilkins. 1829.

Of this collection we had occasion to speak when the first edition appeared. At present we need only say that the work is much improved by very extensive alterations and additions. It possesses still more than formerly a character of individual interest in the selections and of vivacity in the language; which is one of its best recommendations, at a time when teachers of elocution are compelled to feel that most volumes of pieces for speaking are but repititions of the same hackneyed matter.

We are not sure, however, that the taste in which this volume is compiled will be acceptable to all teachers. Rhetorical exercises intended for young minds should sustain a character of mental elevation both in sentiment and expression.

Thoughts on Domestic Education, the Result of Experience. By a Mother, Author of 'Always Happy,' 'Claudine,' 'Hints on the Sources of Happiness,' &c. &c. Boston. Carter & Hendee. 1829. 8vo. pp. 254.

The republication of this valuable work affords us a second opportunity* of inviting the attention of our readers to the subject of which it treats. It is, perhaps, too generally true that American mothers are so absorbed in the routine of domestic duties and cares, as to have but little time left for the most im-

* For first notice of this book see Vol. II. p. 564.

portant of all maternal offices, the guidance of the female mind in childhood and youth. The urgency of immediate concerns is too often pleaded as a sufficient reason for devolving, almost entirely, on others, the charge of what a mother, even under the disadvantages of limited time and opportunities, is best fitted to superintend. We do not wish to advance unqualified assertion for general truth; and we shall perhaps be more fully understood when we say that the moral results of education are, in the female sex especially, the most important; and that a mother's relation to her child is such as ensures that deep interest in the individual character of the pupil, and that intimate knowledge of disposition, which are the true springs of success in instruction, if the developement and formation of the whole mind are regarded. We admit farther that some mothers are, owing to various circumstances which cannot be brought under control, hindered from taking a personal part in the business of education. Still, there remains in our community a very numerous class of society, who are wanting neither in time nor means to accomplish most of their rational purposes, as far at least as education is concerned. In the progress of general sentiment, and the still more rapid improvement of education, families situated as we have mentioned are called, no doubt, to make greater efforts for the instruction of daughters; and it is indeed a respectable, or, rather, quite a fashionable thing, to patronize the best female schools. But expenditure is often in this way substituted for personal exertion; and education still remains at a distance too remote from the main interests of human life.

One of the chief wants of education in regard to the female sex, is that of the individual interest of mothers in the instruction of their daughters, or, at least, an enlightened efficient aid proceeding from maternal experience and observation. To supply this want is the object of the Thoughts on Domestic Education. The work is of course adapted more immediately to modes of life existing in England. But, after all due deduction on this score, there is a fund of enlightened sentiment and of sound judgment in the contents of this book, which render it a valuable source of instruction regarding female education and maternal duties. It is a work which, we hope, will aid in accomplishing extensive good, by suggesting hints and plans of exertion in the minds of individuals, and by contributing to turn the stream of female influence into that channel in which most of all, it is needed,—the education of woman.

Having repeatedly made extracts of considerable length from the work before us, previous to its republication, we think it unnecessary at present to attempt to justify our high opinion of its merits by extensive quotations. The following passages are

selected from parts of the work not hitherto introduced in our pages.

'It has been often declared, that children, for their early reading, prefer tales and stories; the fact is, they can understand no other; tales and stories must therefore be provided for them, conveying whatever instruction it is likely can be understood. But certainly every effort should be made to cause children to relish, as soon as possible, books of instruction and information; indeed the first step of education, is to inspire children with a love of learning, and a desire for information on the principle of its usefulness and agreeableness; this desire once implanted, and books of instruction would be eagerly demanded, and not sedulously shunned.

'But how is this desire to be implanted? The question is not so difficult of reply as may be deemed; let parents suggest and exhibit the benefits occurring from knowledge; this may be done in a variety of ways. Biography offers numerous instances of the happiness and usefulness dispensed by the wise and the learned; biography is pleasant reading, and therefore, it may be presumed, mothers often resort to it for amusement; let them select from it whatever may forward their views; can any one read the lives of Demosthenes, of Aristides, of Alfred, of Reynolds, of Franklin, and a hundred other departed worthies, without meeting with abundant matter to instil the value of improved talents into the minds of children? If she had no selfish pleasure in reading such histories, could a mother think her time lost in obtaining useful information for her offspring?

'The course of life and daily observation affords no limited number of interesting incidents, to demonstrate the benefits accruing from a well informed mind; how many neighbours and friends do not we perpetually notice sinking into misery from their own folly, or rising into respectability by their own merit. In the tone of pity, not of satire, should these fallings from happiness be noticed, for never let us risk making the heart hard, in the pursuit of making the head wise; let us inspire no other sentiment but that of commiseration for the unfortunate; let children be early led to distinguish between hatred of the crime, and pity of the criminal; guilt must be always detestable, but a thousand reasons may be urged to excuse the guilty; and this, without any fear of causing the child to suppose that in his turn, he may commit sin with a prospect of extenuation.

'One plain assertion will do this effectually; that every crime or folly held up to *them* for reprobation, they cannot fall into from *ignòrance* of its direful nature, as probably did the erring persons they are therefore bid to pity.

'To speak of the merits of the wise and virtuous requires no

such precaution; although on this, as all other subjects, exaggeration should be studiously avoided, not only for the sake of good morals, (as exaggeration, being a departure from truth, is only a form of falsehood,) but because our precepts will not be efficacious unless drawn from just premises. Children are very shrewd in their reflections. If they once detect a mother shaping her story to her moral, they will cease to believe that her moral ever springs from her story.

'In respect to books of science and general knowledge, a few of the best written may be agreeable to a child after nine years of age, but seldom before. If a parent be desirous that some insight into such knowledge should be earlier gained, she had better read the book herself, and give her children the information if contains in her own words. Much valuable instruction may be thus inculcated in very early life, and if parents are attentive to seize every opportunity of giving useful knowledge, every occasion when curiosity awakens inquiry, and the ductile mind is peculiarly fitted to receive information, it is impossible to say what bounds could be put to the improvement of the youthful mind. Children would not only gain a daily accession of information, but be fitted to understand future instruction—be disposed to desire it.

'It is hardly possible to give a list of all the books that have been found amusing and instructive to young people. An attempt at such a notice will be found in another part of this volume. But it will be right to suggest, in this place, that the juvenile library should not contain *many* books; a few, carefully selected, will suffice. Children will hence be compelled to repeated perusal, and more knowledge is gained from the repeated perusal of a few books, than the desultory single reading of numerous volumes.

'The practice of giving the morning to studious pursuits should be as early as possible confirmed into habit, and girls, who have completed the course of education, should be urged regularly to devote a few hours to useful studies every morning, as soon after breakfast as possible; not only thereby to avoid the risk of interruption, but to give the powers of the mind, undistracted by other claims of duty or of pleasure, to the service of the mind.

'It is a question whether making memoranda of what is read is beneficial or not. The act of writing it down may indeed assist to fix the desired information in the recollection, but does not the benefit stop there? How seldom is the paper of memoranda looked into? Besides which, when it is written down, it seems unnecessary to load the memory with the passage, so that it is forgotten without effort to retain it. Now, if knowledge is only desirable as far as it is useful, it should be hoarded where it is

most accessible. The book of memoranda cannot be always carried about with us, but our memories are unalienable. It were better, then, not to write memoranda, but to fix a few clear recollections in the memory. So much may not be attempted to be recollected, but what is remembered will be remembered clearly, and the information will be always with us ready for use.

'Reading aloud is recommended, as giving the united assistance of the eye and the ear to the memory. But this advantage can only accrue to the reader, and therefore young persons should never be satisfied with hearing a book read, unless it is some slight work, not demanding thought nor deserving recollection. The mother ought always to be present at the readings, and as much as possible assist in explaining difficult passages, and be prompt in commenting judiciously on the sentiments or events pourtrayed. In reading history, a well informed parent may thus render incalculable benefits, not only in explaining the relation of events to one another, but in leading the young mind to reflect on actions, and comment on characters.

'It has been found highly beneficial to ask a child, after her reading lesson, to describe what she has been reading about; the expectation of this question, induces a closer attention, and thus lays the foundation of a habit of attentive reading. A judicious mother may also gradually lead her pupils to form rational opinions on what they read; at first, some small helps may be given to the young reasoner, but, by degrees, she will acquire fluency in describing events, and an increasing power of reasoning upon them; we may be assured the more we urge children to use their intellectual faculties, the stronger will those faculties become.

'Indeed the best aim of education is to teach children to think for themselves; parents are too apt to save them this exertion, and to think for them; those children who are early thrown on their own mental resources, generally become clever men and women. It would be no difficult matter to guide the thoughts of children imperceptibly to just conclusions; thus, in reading De Foe's admirable story of Robinson Crusoe, the young reader might easily be led into a familiar chat respecting the conduct of its hero, and if himself incapable of pointing out the merits or failings depicted, a consciousness of them could be insensibly awakened in his mind; thus the industry, the ingenuity, the resignation displayed by Crusoe might be noticed and praised.

'Sandford and Merton is a work generally read with earnestness, and offers many incidents and traits for reflection; when Tommy and Harry are lost in the wood, on a cold winter's day, it is natural to observe how superior the sensible clown to his fine gentleman companion, first, in keeping up his spirits, and thereby lessening the mournfulness of their situation, and, secondly,

in having sense to add dry wood to the fire accidently found; it were well to add a remark on the advantage that would have accrued to both, had either little boy known how to produce a fire.

'As childhood passes into youth, a graver strain of reasoning may be indulged, and though memoranda from books are not advised, written remarks of our sentiments upon them are highly desirable; thus, as soon as a work is perused, let some notice of its contents and of our opinion of them be inserted in a book kept for the purpose; the more concise these observations the better.'

The Little Philosopher, or the Infant School at Home. No. 1. Boston. 1829. Carter & Hendee. 18mo. pp. 36.

This is the first of a series of books particularly calculated to aid in the important department of maternal instruction. Like Mrs Hamilton's 'Questions,' it consists of interrogatories intended to develope the reasoning powers of the child, and to direct them to such a course of exertion as will readily elicit answers; but it is suited for children of an earlier age than the 'Questions;' and in the 'Number' before us, it is confined entirely to the physical properties of bodies—the first principles of natural philosophy.

The subjects embraced, are 'Shape, Colour, Hardness and Softness, Weight, Light, Fire, Water, Earth.'

As an example of the manner in which these subjects are presented to the infant understanding, we present the first series of questions on Water.

'Has water any colour? Taste? Smell?

Is it heavy?

Where does water come from? From wells and springs, from brooks and rivers, and from the skies when it rains.

Does it ever become hard?

What makes it become hard?

What is it called when it becomes hard?

Suppose you put some ice in a warm place, what becomes of it?

What does it turn to?

Suppose you put some water over the fire, what becomes of it? It boils and grows less and less, until it has boiled all away.

What does it turn to? Steam.

What becomes of the steam? It goes off into the air, and is spread all about. Why do we not see it? Because it is too thin.

What are the clouds? They are this water, which has gathered again in the air, so that we can see it.'

To persons of any reflection the utility of a course of fireside instruction, conducted in this manner, must be apparent at a single glance. The importance of cultivating an early habit of attention and investigation concerning the properties of external

objects is incalculably great. It is the characteristic which is almost always mentioned in the biographical notices of great men as having been early displayed by them. We hope the time is not far distant when an ardent curiosity and thirst for physical knowledge shall become as common a trait in children as the love of sport, or that sentiment so universally prevalent among our juvenile friends, *the love of holidays.*

Elements of Geometry, with Practical Applications, for the Use of Schools. By T. Walker, Teacher of Mathematics in the Round Hill School at Northampton, Mass. Boston. Richardson & Lord. 12mo. pp. 104.

We have long earnestly wished for a work of this kind, in which the more important principles of demonstrative geometry might be laid down in a manner adapted to the wants of our high schools and academies. We rejoice therefore at the appearance of this little work, and we have looked it over with eagerness and delight. It seems to us a book, which will do for geometry what Colburn's excellent work has done for algebra—make a science, hitherto vulgarly esteemed dry, and uninteresting, popular among the young of both sexes, and studied with pleasure and advantage by all who aim at possessing an English education, in any degree, finished. We do not say this because we believe the author has made any essential improvement in the science itself. Geometry has remained, in all that is important, nearly the same since the days of Euclid. The utmost, which the most profound modern mathematicians have been able to effect, is to improve the arrangement of the propositions, to add a few new ones, and to call to their aid the formulas of algebra. The works passing under the name of Simson, Playfair and Legendre are nearly perfect in their kind. But they presuppose too much previous knowledge of mathematics, are too abstruse, too large, and too expensive for general use in schools.

What was wanted, therefore, in an important department of elementary education was a book reduced in size and price, simple, and plain in style, full in explanation, avoiding unnecessary technicalities, and explaining the more common and important practical uses of this noble science. Such a work we had been encouraged to expect from one whose elementary works have done more for the developement of the young mind, than those of any other author of our country. But since that has been delayed, and perhaps laid aside, we are gratified in being able to recommend to our readers another which possesses precisely the requisites, we have just mentioned.

It is unnecessary here to speak of the important results to be produced by introducing geometry into all schools of the highest

grade. It is unnecessary to describe the beneficial effect, which the study of the science has on the mind, in sharpening its powers, in imparting accuracy, order, and precision to the reasoning faculty, nor of the grand results to which it leads in astronomy and geography enabling us to measure the heavens and 'mete out the earth;' to calculate distances on the pathless ocean; and to find how far asunder are the tops of distant mountains; to ascertain the heights of the 'everlasting hills,' and the size, elevation, and distance of the passing cloud. We shall hope, therefore, to see this work soon in general use, in the highest classes of schools of both sexes, and shall expect to see it produce important and beneficial results; both as affording an excellent discipline for the mind, and as preparing the scholar in the best and most thorough manner, for a clear knowledge of mechanics, natural philosophy, astronomy, surveying, navigation, and the kindred arts and sciences.

A Practical System of Modern Geography; or a View of the Present State of the World. Simplified and adapted to the capacity of Youth: containing numerous Tables exhibiting the Divisions, Settlement, Population, Extent, Lakes, Canals, and the various Institutions of the United States and Europe; the different forms of Government, Prevailing Religions, the Latitude and Longitude of the principal places on the Globe. Embellished with numerous Engravings of Manners, Customs, &c. Accompanied by a new and improved Atlas. By J. Olney. Second Edition. Hartford. D. F. Robinson & Co. 1829. 18mo. pp. 269.

This work is arranged in the catechetical form, and is, in our, opinion, therefore, less fitted to excite thought, and lead to the exercise of judgment, than if it were on a plan not so liable to degenerate into routine, in the actual business of instruction. In other respects the book is well suited to aid in imparting a practical and thorough knowledge of geography, as far as elementary works usually go. It has also several good points peculiar to itself in the arrangement and succession of the lessons.

Books for Children.

The Talisman: a Tale for Boys. Boston. Wait, Greene, & Co. 1829. 18mo. pp. 105.

This tale is a production of one of the ablest writers of fiction in this country. Its design is to cultivate a pure moral taste and to infuse a strength of moral courage into the minds of boys in their school-going days. It is gratifying to see such talents devoted to such a purpose. The story is so interesting and delightful, the style so colloquial and purely English, the charac-

ters so natural, and the whole so perfectly unaffected; that there is no hazard in predicting that it will become a favourite in all academies for boys—a fashionable present from mothers who regard the best and highest interests of their sons.

A Brief Memoir of the Life of Dr Benjamin Franklin. With an Appendix. Compiled for the use of Young Persons. New York. Mahlon Day. 1829. 18mo. pp. 90.

This is an excellent specimen of what might be done in the way of useful publications for the young. Of course such reading is not intended for mere children; as it requires a degree of thought and reflection beyond that attained in childhood. But we know of few books more deserving than this to be found in family libraries, with a view to being read by every member of the domestic circle, who is old enough to understand it.

The Mother and her Children, or Twilight Conversations. By Abigail Mott. New York. Mahlon Day. 1829.

This is another plain and practical little volume, intended chiefly for usefulness, but rendered entertaining and attractive by a judicious selection of subjects and an easy, animated style. This volume is adapted to juvenile capacities, but admits in a peculiar manner of the superintending mind of a mother accompanying those of its young readers in their progress through the whole.

Rhode Island Tales. By a Friend to Youth, of Newport, R. I. New York. Mahlon Day. 1829.

Simple and easy verses for the young are, as yet, one of the rarest things in the 'book' market. Writers of this description of poetry are generally in pursuit of striking imagery, or lofty and abstract morality, very little accommodated to juvenile tastes or to juvenile life. This is a matter of regret; for at no period can poetry be rendered more influential on the mind, than in early childhood. All that children naturally understand and like, is in fact poetry, as far as thought and feeling and imagination are concerned. But grown people are too prone to forget this, and to go in quest of artificial circumstances, and laboured expression, when attempting to write for the mind of childhood.

The little volume mentioned above is a happy exception to the general practice in this respect. It manifests no over ambitious aim in thought or language; and its only fault is that of human life itself, as managed by adults,—viz. that it is sometimes dull and prosaic. This, we think, is the right sort of fault, (if we may use such a phrase,) in books of this order. It leaves the mind unexcited and uninjured, while a single exaggerated metaphor, or affected expression, or overdone description does more harm to the tender mind than can be calculated or expressed.

The Pet Lamb in Rhythm: intended as an innocent exercise for the Memory of Children. New York. Mahlon Day. 1829.

The preface to this miniature volume deserves the attention of mothers and teachers. It is by no means common to meet with a train of original and ingenious thought on the subject of education, in the preface to a toy-book, yet here it occurs; and the matter to which it forms an introduction, is well worthy of it. The whole book makes not only a pleasing story but an excellent exercise for the memory; and the frequent repetition so ingeniously involved in it, would make it a very useful manual for first lessons in reading.

The Infant Library. New York. Mahlon Day. 1829.

This is a neat little volume, formed by binding together two dozen of little toy-books, of the kind usually sold at a cent a-piece. The peculiarity of this selection is that it has been formed with care and attention, and, as seems to us, with much judgment and taste. Instead of the trash usually offered in this form, we have here a little collection of useful and entertaining matter in a great variety of shapes. The publisher who turns mind and capital into such channels, is a true friend to childhood, and deserves well of parents and teachers.

The Child's Library. New York. Mahlon Day. 1829.

This volume differs from the preceding, only in containing matter adapted to older children than are intended in that, and in the size and cost of the book being somewhat greater.

The books now mentioned are portions of a series somewhat similar in design, though not, in our opinion, equally meritorious in all cases. Several of these, however, would have been selected for particular notice, at present, had our limits permitted.

In bringing these humble publications before our readers, an important service, we trust, is done to the interests of domestic education and of infant schools.

In justice to the publisher of these books, and, at the same time, in explanation of the circumstance of a succession of notices confined to the productions of one press, we ought, perhaps, to mention that the interest expressed in these publications had its origin in the accidental falling in with a copy of one of the smallest class of these books, when in search of a work of a different nature. The apparent merit of the little volume led to a desire to peruse the series to which it belonged; and the result was the conviction already expressed, that to assist in attracting notice to the whole, with a view to the selection of the best, would be perhaps a useful service to parental instruction.